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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Essence of Business

WHEN the time arrives for taking stock of the present difficulties of the financial world, when some of the big recent mergers have been unmerged and the rationalised industries derationalised, and all the capital inflation of the post-war boom written off and forgotten, some student of these things will be able to tell us how much of our present troubles is due to the Companies Act of 1929 and previous stupidities of the kind. No business man can be unaware of the grave obstacles to commercial enterprise associated with all the forms and ceremonies and disclosures and publicity with which business is now surrounded. It may well prove that an ignorant legislator, in a futile attempt to catch a thief, has so handicapped all the wisdom of commerce as not only to add to its difficulties but to render the thing in some cases impossible.

The very essence of business is risk taking. Accounts have to be opened in the hope that they may balance. It is often very important that the knowledge of the risk should be restricted to the men who are responsible for taking it. Much of our business, when analysed, is of this nature. Much of that sort of business is now impossible, and the employment associated with it has gone because of legislative requirements that lay down that a young and novel and enormous accountancy profession should conspire with Somerset House to disclose all the inner workings of the thing before the wheels have had time to get into motion. Doing business to-day is something like playing bridge with all the cards on the table, and bridge that way becomes another game. The modern world may learn how to play it, but the members of the Portland Club would find it a little difficult.

Dry Ice

THE ice box has never made great headway in this country, partly because our climate does not make it a necessity, whilst the cost and difficulty of obtaining regular supplies of ice have retarded its use as a luxury. The march of progress has replaced it in the household by refrigerators, either electrically operated or controlled by gas and water, which need only to be reliable in use to find wide application. In America the refrigeration industry has evolved something entirely new, namely solid carbon dioxide, known familiarly as dry ice. Primarily intended for maintaining low temperatures during transport, it is likely to effect little short of a revolution in the methods of handling food. The manufacture of dry ice is simple—given a supply of pure carbon dioxide gas free from taint or odour, it is only necessary to liquefy it, supercool the liquid, and allow this to expand into a suitable box wherein the snow formed can be compressed to a solld block. The cost is largely a function of the power charge, and competition in America has brought dry ice down to a very low figure. The use of dry ice is revolutionising the ice cream industry, to-day said to be worth £70,000,000 a year in America and still growing. Apart from improvements in the raw materials due to a better understanding of the scientific requirements of a fine ice cream, the texture has been improved by quick freezing. The great innovation is the delivery to the customer of the ice cream, even in elaborate moulds, in perfect condition several hours after it has left the store by means of dry ice. A specially insulated corrugated paper box is used allowing free circulation of the cold evaporating gas produced from tablets of dry ice which do not come in contact with the ice cream, the quantity being regulated by the packer according to the time to elapse before serving. In this way the radius of distribution has been greatly extended and almost every household can serve the delicacy in perfect condition. Though we are not yet eaters of ice cream in this country, there does seem a field for enterprise on these lines.

America has also turned its attention to quick freezing of foodstuffs, particularly fish and meat, with advantage both to the producer and consumer. Owing to the speed of freezing at the low temperature, the ice crystals formed are very small and do not rupture the cells, so that the foods so preserved are more palatable on thawing, and can be kept in good condition much longer. The enthusiasts contemplate filleting and

chilling the fish at the port of landing, or even at sea, and cutting up the meat at the packing houses into steaks and chops, frosting it, wrapping it, and keeping it at a temperature below freezing point till it reaches the consumer. The refrigeration during transport, and whilst in the hands of the wholesaler and retailer, and even during transport to the home, will be effected by means of dry ice, the packages being kept in a sterile atmosphere of cold carbon dioxide gas. The same treatment is contemplated for fresh vegetables which will be kept chilled from the time they are picked in the market garden until they are dropped into the cooking pot!

The actual distribution of some of these frosted products has begun and it is certain that any initial difficulties will be speedily overcome. The average American household will be able to have more than ever the products of the hemisphere on its table in and out of season in perfect sterile condition.

The Study of High Pressures

THE study of "Industrial High Pressure Reactions" is to be the subject of a special symposium at the 18th meeting of the American Chemical Society at Cincinnati next month. For several years past there has been a notable increase in the pressures and atmospheres utilised in connection with chemical processes, but instead of reaching the end we are apparently nearer the beginning of methods that have already partly revolutionised the chemical industry and promise to be equally important in their effects in the future.

Professor Norman Krase, who is making arrangements for this American conference, confidently predicts that the hydrogenation of petroleum, the production of synthetic nitrogen, and the manufacture of methanol from water gas are merely the starting-point of a revolutionary advance in which many of nature's processes will be outstripped. All that synthetic and organic chemistry has so far done for civilisation will yet be more easily done, and manufacturers of chemicals and dyestuffs may expect to be freed of present laborious processes and given a more direct approach to results. In the hydrogenation of petroleum the use of these high pressures has already revolutionised manufacturing processes. The synthesis of higher alcohols from water gas has disclosed additional sources of supplies, and costly research and experiment by industries and universities will certainly develop still further this new technique of high pressure work.

It is estimated that in the United States a pressure of little less than seven tons is employed in the synthetic ammonia process. Two and a quarter tons are required in the hydrogenation of petroleum and the production of methanol or synthetic wood alcohol. These pressures are combined with temperatures ranging from 450 to 600° C. The advantage of using in combination these high pressures and high temperatures to bring about certain chemical reactions has, of course, long been recognised, but it is only in comparatively recent years that they have come into fairly general use. In the high pressure researches into alcohols from mixtures of carbon monoxide and hydrogen, experiments are now proceeding in the United States to determine whether alcohols higher than methanol or wood alcohol may not be produced. With wood alcohol as an intermediate product the higher alcohols are already being formed chiefly by successive condensations of lower ones. The results already obtained are remarkable, but it is possible that future results may be enormously more important.

The reports to be presented at the American conference will record the progress made up to date and indicate possible lines of advance for the future. The experts of the Standard Oil Development Co. will review the work done by that company in the hydrogenation of petroleum; Dr. Frolich and D. S. Cryder, of the Massachusetts Institute of Technology, will describe their researches into the synthesis of new organic compounds from such relatively cheap and plentiful materials as water gas. Other subjects to be discussed are the production of anhydrous ammonia from atmospheric hydrogen and water gas, and synthetic wood alcohol from water gas; reactions of ethanol; fundamental properties of gases under pressure, and specific heats of nitrogen under high pressures. The conference promises to cover a very wide field and to bring together in a convenient form the latest results of research in the United States, together with indications as to future progress.

Non-Ferrous Metals Research

AN important development is announced by the British Non-Ferrous Metals Research Association which indicates considerable success in the past and growing confidence in the future. The Association, in a word, proposes to centralise its offices and provide accommodation for a laboratory and workshops for its research and technical development departments in London, this apparently involving a transfer of the headquarters from Birmingham. The Association, founded ten years ago, has made steady progress under the direction of Dr. R. S. Hutton, and now carries out a great variety of work for all sections of the non-ferrous metals industry at an expenditure of between £20,000 to £25,000 per annum. A special appeal for increased annual support has recently been organised and has met with encouraging success. The Association has already demonstrated its value to industry, particularly in the discovery of new engineering materials and in solving problems of increasing the efficiency of production and of overcoming the causes of defects, matters of great economic importance to the metal and engineering trades.

The Association has just enlarged its staff by appointing Dr D. H. Ingall as assistant director and research manager, to take effect from January next. Dr. Ingall is well known for his metallurgical research and administrative work, and as first Principal of the Constantine Technical College, Middlesbrough, has been largely responsible for its equipment and organisation. Dr. O. F. Hudson will continue as senior metallurgist. Mr. G. L. Bailey, M.Sc., of the Metallurgy Section, Research Department, Woolwich, has been appointed from September 1 as development officer to fill the position recently vacated by Mr. S. J. Nightingale, who resigned to accept an important position in industry.

The Safe Handling of Poisonous Chemicals.—(II)

By J. P. Rogers

The following is the concluding instalment of Mr. Rogers' article dealing with the preventive and remedial measures necessary for the protection of workers amongst poisonous and corrosive chemicals. The earlier part of the article appeared last week.

THE aromatic amino and nitro compounds form a class of dangerous blood poisons which, unlike benzene, are as readily absorbed through the skin as through the mucous membrane. Aniline is less rapid in its effect than benzene, weakness coming on gradually an hour or so after exposure. In the case of nitrobenzene a dose of twenty drops has proved fatal. Aniline is more toxic than nitrobenzene and the dinitrobenzenes and nitranilines are more toxic than aniline. The lips turn blue and sometimes this discoloration appears over the whole face. Fortunately the salts of aniline do not penetrate the skin, hence the workmen should be provided with a dilute solution of acetic acid or other weak acid in which he may immerse his hands should aniline be spilled on them. The aniline salts may then be easily washed off with water.

The handling of explosives is attended by risks of poisoning, since they are practically all nitro compounds. Trinitro toluene (T.N.T.) caused much distress among munition workers during the late war. It is easily absorbed by the skin and leads to serious digestive trouble and liver complications. The aliphatic nitro compounds are also strong poisons.

Local Affections

The azo dyes generally, crude anthracene and the chloronitrobenzene derivatives irritate the skin and lead to the formation of small boils. Some workers are particularly susceptible to these affections. When sores appear the part should be bathed with alcohol to remove the poison and boric ointment applied. If rubber gloves are worn they should be washed inside and out at the end of the shift to prevent these compounds remaining in contact with the hands. In this type of poisoning cleanliness is better than cure.

Corrosives

Phenols and the cresols are highly corrosive, both internally and externally, and the hot vapours should not be breathed for any length of time. Burns on the skin should be immediately treated by the application of olive oil. These corrosives have first an irritant, then a local anæsthetic, action, and turn the skin white owing to coagulation of the natural proteins. Care should be taken not to allow phenol to remain in contact with the fingers, or gangrene may be the result. Strong solutions of some phenols are caustic to the skin—*e.g.*, resorcinol.

The mineral acids are corrosive to the flesh in varying degrees, but the most vulnerable part is the eye. One splash may perhaps result in the loss of sight, hence it is very important that all acid workers be compelled to wear goggles, often against their wish. Concentrated sulphuric acid or quicklime should always be wiped off before washing the skin, to prevent the flesh from being burned by the heat of the mixing with water. The most troublesome of the acids is hydrofluoric, the vapour of which attacks the eyes badly. It produces exceedingly painful and slow-healing, sores after even a momentary contact. Should the acid of any strength come into contact with the skin, immediately wash in the coldest water available until the burning ceases or until the white skin turns pink. If the burn is severe, prolonged washing is necessary. Then wash with weak sodium bicarbonate solution and cover the burn with lint previously soaked with a solution of mercuric chloride, 1 in 3,000, and apply a bandage.

Pure wool clothing and a felt hat are suitable wear when dealing with the mineral acids, and cotton clothes if caustic alkalis or their concentrated solutions are being handled. Rubber gloves will prevent the hands being attacked.

Metallic Poisons

Most of the metallic poisons find their way into the system through the mouth, and are thus comparatively easy to keep under control. Some, however, are absorbed by means of cuts and wounds or by penetrating the unbroken skin. Wounds on the hands should be covered with oiled silk if any metallic poisons are being handled. Bismuth salts and the dichromates will enter through a wound only, whilst arsenic and antimony salts, finely divided mercury and lead oleate, for example, penetrate the skin, producing general toxic symptoms. Two types produce a local action: (*a*) caustics—*e.g.*, zinc and antimony chlorides; (*b*) those causing skin diseases, such as matchbox dermatitis, contracted through handling phosphorus sesquisulphide.

It is possible for mercury to be absorbed through the pores of the skin, but the danger of continued handling of the metal lies in the fact that it volatilises slightly, even at ordinary temperatures. In chronic mercury poisoning, red blotches appear on the skin and the teeth become loose. Where mercury is volatilised in any process, special care must be taken, by means of forced-draught ventilating shafts, to safeguard the worker. Most inorganic compounds of mercury are very poisonous, owing to ionisation, while many organic mercury compounds are comparatively non-poisonous. Mercury diphenyl and mercury dialkyl compounds, on the other hand, are among the most poisonous substances known.

Some of the organic derivatives of arsenic are much more dangerous than others. Atoxal (mono sodium-*p*-arsanilate), which is the starting point in the manufacture of Salvarsan, is a cumulative poison, ultimately leading to complete blindness, nervous disorders and kidney complications. Salvarsan is much less toxic, but, in contact with air, it is readily oxidised to 3-amino-4-hydroxyphenylarsine oxide, which is twenty times as toxic. The dust of any arsenic compound should not be allowed to enter the nose or mouth. Strict cleanliness must be observed and the hands frequently washed. Two grains of As_2O_3 have been recorded as fatal.

On account of the formation of insoluble lead albuminate, lead is absorbed internally with extreme slowness, but owing to still slower excretion, cumulation may occur, lead poisoning frequently being caused by the absorption of small quantities over long periods. Anæmia, severe abdominal colic are caused and the gums show a blue line on the free border, due to the deposit of lead sulphide. The treatment of lead poisoning should be preventative as well as curative.

First Aid

In addition to the ordinary First Aid Box, there should be a case, readily available, containing the necessities for treating the type of poison being handled, the person in charge being thoroughly conversant with their application. It should include the following:—(1) Universal gas mask; (2) oxygen cylinder; (3) soft stomach tube; (4) mustard; (5) common salt; (6) smelling salts; (7) olive oil; (8) epsom salts; (9) powdered chalk; (10) citric acid, dilute solution; (11) sodium bicarbonate; (12) calcium saccharate solution obtained by mixing slaked lime 5, sugar 10, distilled water 100, allow to stand and decant the clear liquid; (13) arsenic antidote—add ½ oz. solution of ferric chloride 10 per cent. and 2 drachms ammonia solution 10 per cent. Mix when required; (14) tin of coffee; (15) tin of tea; (16) copper sulphate solution (2½ grains in 3 oz. water).

Poisonous Chemicals with their Antidotes

Mineral Acids: Hydrochloric, nitric, sulphuric, etc. Corrosive Organic Acids: Formic, acetic, etc.	Calcium saccharate solution or chalk.
Oxalic acid, soluble oxalates.	Calcium saccharate solution.
Hydrocyanic acid and cyanides.	Arsenic antidote. Oxygen.
Phenol and cresols.	Epsom salts solution.
Caustic alkalis.	Citric acid solution.
Antimony salts.	Copious draughts of warm water with tannic acid or strong tea.
Antimony chloride.	Calcium saccharate solution and strong tea.
Arsenic compounds.	Arsenic antidote.
Barium salts.	Epsom salts solution.

Copper salts.	Sodium bicarbonate 120 grains in water, or potassium ferrocyanide 10 grains in 2 oz. water.
Iodine.	Calcium saccharate solution.
Lead salts.	Epsom salts solution.
Mercury salts.	White of egg beaten up with milk.
Phosphorus.	Copper sulphate 2½ grains in 3 oz. water.
Silver salts.	Common salt.
Zinc salts.	Sodium bicarbonate and strong tea.
Ptomains, Alkaloids, vegetable.	Tannic acid or strong tea.

General Principles for Treatment of Poisoning

1. Remove poison from the stomach by siphoning with the stomach tube, or by giving one tablespoonful of mustard in 8 oz. of water, or by chemically neutralising the poison. (CAUTION.—Stomach tube must not be used or mustard given in poisoning by corrosives.)

2. Lay patient in a recumbent position and keep warm, give strong tea or coffee to drink.

3. Apply artificial respiration if necessary.

4. When the poison has been eliminated as far as possible give a demulcent—milk, olive oil or white of egg.

In all cases of poisoning medical aid is essential.

Strict cleanliness is essential to the health of any person who is engaged in the manufacture or handling of poisonous chemicals. Clothes and overalls should be changed if possible before leaving the works, and should be washed frequently. The walls of the room are best made of glazed bricks and the floors of cement covered with gratings, to prevent the accumulation of material under foot, so that they may be washed down with a hose at least once a week. Each spill should be immediately washed away. An ample supply of water, available at any time, for washing the hands, should be provided. Gas masks and respirators are best cleaned once a week, whether they are used or not, as an inefficient mask gives a false sense of security which may be very dangerous.

All apparatus should be well closed, so that no leakage occurs. It is essential that all joints and valves be periodically examined and any defects immediately rectified. Efficient ventilation is important, and where the plant is in a closed room and it is necessary to open it periodically, a ventilating hood, above the apparatus connected to a low vacuum pump, is a necessary preventive; the next best precaution is a large fan ventilator in the roof.

The operatives should be medically examined periodically, particularly where blood poisons are the danger, and every unnatural state of health followed up, the worker being given a change of occupation away from toxic surroundings, on the advice of the physician. Employees showing signs of tendency towards diseases of the lungs, heart or kidneys, hæmorrhage or anæmia, will be well advised not to work where blood poisons are being used. Certain persons possess idiosyncrasies towards some chemicals, and it is to their advantage as well as that of the employers that they should not be unduly exposed.

Production of Acid Resistant Alloys

THE American Haynes Stellite Co., Kokomo, Ind., a unit of Union Carbide and Carbon Corporation, has announced the completion of a foundry at the Kokomo Works, which has been built expressly for the manufacture of the Hastelloys, a group of new acid resistant alloys. The most up-to-date and efficient foundry equipment procurable has been installed to ensure careful control of quality and uniformity of product. The Hastelloys form a group of corrosion-resistant alloys with unique properties. They are of particular interest to chemical engineers and others who have been faced with the hitherto difficult problem of providing suitable equipment for resisting the action of hydrochloric acid and moist chlorine. Hastelloy "A" is the only alloy, available commercially, which resists the action of both hot and cold hydrochloric acid, while Hastelloy "C" resists the action of wet chlorine.

Advances in Use of Pulverised Fuel

Example of Derby Electricity Station

ONE of the most interesting aspects of the 1929-1930 extensions of the Derby Electricity Station just recently opened is the illustration of the remarkable advances of pulverised fuel firing during the last five years. Essentially the new plant consists of two "Combustion Steam Generators," a new design of water tube boiler, each of 60,000–80,000 lb. evaporation per hour, and a "Parsons" 20,000 k.W. turbo-generator, with turbines of the single cylinder pure reaction type for high efficiency. The steam generators are fired with "Lopulco" pulverised fuel equipment, which includes the entirely new "Volcano" burner and the latest "Duplex" type of pulverised coal feeder, while also the chimney gases are all washed with pressure water sprays to remove fine dust.

Pulverised fuel firing, according to the "Lopulco" system was first adopted at Derby in 1924 on two "B and W" boilers, while a third "B and W" boiler was installed in 1928, the results being excellent, but the present 1929–1930 extensions constitute a further notable advance. The new boilers have been designed and constructed by Combustion Steam Generators, Ltd., of London, a subsidiary of International Combustion, Ltd., and consist of a steam and water drum with four complete combustion chamber walls of "Murray" fin water-cooled steel tubes in series with the boiler. The roof of the combustion chamber is formed of horizontal boiler tubes with the water screen below the "M.L.S." superheaters. "Usco" multiple plate air heaters and "Foster" steel tube economisers with cast iron fins are included, the pressure being 350 lb. and the temperature 750° F. The new "Volcano" burner, of which only one is required per boiler, burning up to 5 tons per hour, is a somewhat modified "R" turbulent burner, but fixed in the bottom of the combustion chamber pointing vertically upwards, projecting through the water screen tubes, some of which are diverted for the purpose, the flames therefore spouting upwards. The outer casing of the volcano burner is a large firebrick cone, and as with the "R" burner there is both primary air carrying the pulverised coal and secondary air passed to the burner, each of which is given a turbulent motion by helical vanes.

Further to increase the mixing action in the combustion chamber, part of the secondary air is now projected from the lower part of the steel tube walls as a series of jets, while no brickwork is used for the boiler setting, which is entirely of steel plate. An additional 6 ton per hour "Raymond" pulveriser has been installed, and at the present time Derby has five rabble arm coal driers of the "Rosencrantz" design, and three "Raymond" mills of 6 tons per hour. For feeding the pulverised coal to the burner, two "Duplex" feeders are used, consisting of two horizontal perforated plates with a rotary scraper between replacing the screw feeders, while the washing of all the combustion gases with water sprays to remove grit takes place near the base of the chimney.

World Rayon Production

Reduction in British and U.S. Figures

THE production of rayon during the first six months of 1930 is estimated at 91,289,000 kilos. This is only slightly less than the production in 1929, but it is anticipated that a further fall will be registered this year, as despite a cut in output in the second quarter there has still been a surplus. The output during the first quarter amounted to 47,188,000 kilos., whilst in the second quarter, the output fell to 44,101,000 kilos. There has been a considerable reduction in output in the United States and in Britain as well as in many of the other countries, and the only process which appears to have withstood the general decline is the acetate. Nevertheless, this still accounts for a very small proportion of the total production for, in the three months ended June, out of a total of 44,101,000 kilos, acetate only amounted to 3,314,000 kilos. Viscose on the other hand totalled 38,219,000 kilos during this period. There has been some falling off, probably temporary, in the output of cupra ammonium rayon, whilst the drop in collodion output has been continued. The output of cupra in the second quarter of the year reached only 1,538,000 kilos and that of collodion 1,030,000 kilos.

World Production of Sodium Sulphate

Huge Resources of Canada

An interesting review of the world resources of sodium sulphate and a comparison of the output of the principal producing countries, has been compiled by Mr. H. O. Moraw, of the chemical division of the United States Department of Commerce, and is published in "Commerce Reports."

ALTHOUGH crude sodium sulphate or salt cake, as it is known in the trade, is one of the basic raw materials for several important industries—the heavy chemical, rayon and textile, glass and ceramics—its largest use is for the manufacture of kraft paper stock. The increased activities in these branches, and particularly in kraft pulp manufacture, in the last two years have added materially to the demand for salt cake.

Coincident with the increased consumption of salt cake, changes were taking place in the processes of producing hydrochloric acid, from which branch the major portion of the United States output of salt cake has been obtained as a by-product (208,565 tons in 1927), and of producing nitric and sulphuric acids, from which nitre cake is a by-product and from which salt cake also may be produced cheaply. To-day, by-product salt cake from the old hydrochloric-acid process has been largely eliminated by the use of the process of direct synthesis of this acid from chlorine and hydrogen gases. The major portion of the nitric acid is produced by oxidation of ammonia, as well as nitrous oxides for sulphuric acid plants, so that both the salt-cake and nitre-cake supplies as by-products from these processes have been diminished to the extent of the replacement thereof by these new installations.

Nitre cake, formerly regarded as a waste product, was valued chiefly because of its sulphuric-acid content, varying from 30 to 35 per cent. Its chief use was as a substitute for that acid for producing salt cake, metal pickling, absorbing ammonia, and acidifying phosphate rock. With the scarcity of salt-cake supplies, nitre cake, which has been produced at the rate of 150,000 tons annually, was called into use as a substitute, so that the surpluses heretofore maintained were consumed. Large quantities were used incidentally in the last few years in ore and metallurgical operations.

Authorities in the United States estimate the recoverable sodium sulphate content of the Great Salt Lake at 30,000,000 tons, and sodium chloride at 400,000,000 tons. An important sodium sulphate deposit in Arizona has been estimated to contain 25,000,000 tons.

Largest Known Deposits

The largest known deposit of sodium sulphate in the world exists at Ingelbright Lake, about 40 miles above Hatton, Canada, according to the Department of Mines of the Dominion Government. Among other more important Canadian deposits are those of Saskatchewan, which, taken together, have been estimated to contain over 100,000,000 tons of hydrated sodium sulphate. In spite of this, the imports of salt cake as shown from 1922 to 1929, inclusive, ranged from 31,000 to 42,000 tons, while production did not exceed 9,000 tons in any one year. The constant demand for salt cake and the large increase in consumption of nitre cake within the last two years stimulated commercial interests to undertake an expansion of the production of the former from the natural deposits. This development is closely associated with the large demand by nickel interests for nitre cake as a fluxing agent in ore smelting. Their large-scale activities have involved a $40,000,000 expansion programme over the past four years and call for an additional $10,000,000 expenditure yet to be made on the development of the rich nickel, copper, and rare metal ores in Ontario. The importance of this development as a sodium sulphate consumer is indicated by the fact that Canada supplies 90 to 95 per cent. of the world's nickel.

As a result of the growing requirements for nitre cake and salt cake, for the production of sulphate pulp and other chemicals, and as a substitute for soda ash in glass production, the Canadian Horseshoe Lake Mining Co. is expected to have in operation in Ormiston, South Saskatchewan, by the middle of the current year, a plant for the production of at least 36,000 tons of sodium sulphate annually. Canadian Industries (Ltd.), at Copper Cliff, is constructing a plant for the conversion of smelter fumes to sulphuric acid, which will have space for four 50-ton-per-day sulphuric acid units and nitre-cake production capacity of 200 tons per day, with room for expansion. Ample storage space is provided for sodium sulphate, which is to be obtained from the Horseshoe Mining Co.

European Producers

The principal European salt-cake producers, with the approximate output in metric tons, are Germany, 290,000; the United Kingdom, 150,000; Belgium, 50,000 to 80,000; and France, 135,000. Germany has in the neighbourhood of 125,000 to 150,000 metric tons for export; Belgium, around 20,000 tons; France, in 1926, had approximately 32,000 tons, which declined to 6,000 tons in 1929; while Great Britain's export surplus amounted to 87,000 tons in 1928 and increased to 134,000 tons in 1929.

Since 1925 there has been a German and British agreement to allocate markets for salt cake. British markets were reserved to England; German, Czechoslovak, and Austrian, to Germany; and there was a 40:60 English-German division of all other export markets. Plans for inclusion of other countries having an exportable surplus involved according Belgium 30 per cent. of its home market and 20,000 tons for export, and France its home market and 70,000 tons for export. Both Belgian and French export stocks were to be sold by the Sulphate-Vereinigung (German salt-cake cartel) of Frankfort-on-Main.

German Resources

The German resources in this commodity overshadow those of the combined European producers, the major portion of the German product being obtained from waste magnesium sulphate liquors resulting from fertiliser potash production. These liquors, until recent years, were dumped into German rivers, but upon the development of the process of converting the magnesium sulphate to sodium sulphate by appropriate mixing and cooling with sodium chloride, production costs were greatly lowered and a large exportable surplus of salt cake resulted. No detailed information is available regarding muriatic-acid by-product salt-cake production in Germany, but the quantities produced might be roughly estimated from the hydrochloric-acid production total—250,000 to 275,000 metric tons—of which about two-thirds is by the sodium-chloride-sulphuric-acid process.

German exports of sodium sulphate and acid sodium sulphate totalled 177,374 metric tons in 1929—an increase from 120,394 tons in 1928 and 199,331 in 1927.

Sodium sulphate in France is made largely to meet the needs of the glass plants and chemical production. The 1929 output is estimated at 135,000 metric tons, compared to 130,000 tons in 1928. The exportable surplus of this product, which France had in 1926, declined markedly—from 32,283 tons to 6,622 in 1929. No sodium sulphate is imported into France.

Practically all of the sodium sulphate in France is a by-product of hydrochloric-acid production, which fluctuates around 110,000 metric tons annually, depending upon the demands of the glass industry for salt cake. The disposition of nitre cake, such as results from French nitric-acid production by the sodium-nitrate-sulphuric-acid process or from the sulphuric-acid industry is not made public. French nitric-acid consumption approximates 25,000 tons a year, and, until 1928, synthetic nitric-acid production was not actively developed in France.

Sulphate Pulp

The United States is the largest, and Sweden the second most important, producer of sulphate pulp. Although having large supplies of cheap salt cake, Germany has a relatively small production of sulphate pulp, which, in 1929, totalled 46,500 tons. This figure represents a growth to nearly three times the 1920 output. Sulphate pulp production in France is reported to be growing. France exported appreciable quantities of sodium sulphate a few years ago, but its shipments have declined to one-fifth of the 1926 figure. Great Britain, one of the largest exporters of sodium sulphate, is not in the list of leading producers of sulphate pulp. Sweden

and Finland are the largest European producers of sulphate pulp but must import most of their salt-cake supplies.

Three Forms Produced in Italy

Sodium sulphate is particularly important to Italy as a base for sodium sulphide, a requisite for sulphur dyes, which make up over two-thirds of the Italian synthetic dye production. Likewise, sodium sulphate is used for viscose rayon production, in which Italy ranks as the second world factor.

According to trade circles, sodium sulphate is produced in three forms in Italy—the anhydrous, crystal, and crystal in needle shape. The first two are used for industrial purposes, such as the manufacture of paper, textiles, and glassware, and by tanneries. The third type, commonly known as "Sale Inglesa" or "English Salts," is used for medicinal purposes.

Sicily produced 730 metric tons of natural sodium sulphate in 1927. Some crystallised sulphate is produced as a by-product from pyrite ash, by the Montecatini Co., at Marghera. This plant has 20,000 tons yearly capacity and its production in 1929 increased to 5,207 metric tons from 3,725 in 1928. Italian production of combined anhydrous and crystal sodium sulphate increased from 20,000 tons in 1922 to nearly 37,500 tons in 1926. Approximately the same quantity of sodium sulphate (36,740 tons) was imported in 1926. This import trade declined to 31,451 tons in 1927 and a further substantial decrease occurred in 1928 and 1929, to 16,914 and 10,572 tons, respectively.

Hydrochloric and Nitric Acid Operations

The existing production capacity of Italian plants for hydrochloric acid is reported as 80,000 tons, by three processes—direct synthesis, using hydrogen and chlorine obtained from the electrolytic caustic soda production by action of sulphuric acid on sodium chloride, and by the reaction of chlorine and steam over coal by the Poma process. Production of hydrochloric acid reached its peak of 45,800 tons in 1926 and dropped to 43,340 tons in 1927. That portion of the hydrochloric-acid output obtained by the sodium-chloride-sulphuric-acid process is governed by the market for sodium sulphate, which was weak in 1928, but strengthened in 1929 when production of both salt cake and hydrochloric acid increased.

Italian production of nitric acid is mainly from synthetic ammonia oxidation and totalled slightly over 22,000 tons in 1927. If any nitre cake is produced, it is of comparative unimportance. The latest production figures for nitre cake are for 1926, when 36,000 tons were reported, most of it probably from sulphuric-acid plants. In 1927, 13,629 metric tons of anhydrous and 9,440 tons of crystal sodium sulphate were produced. Recent Italian sodium sulphate imports are: 31,451 metric tons in 1927, 16,914 tons in 1928, and 10,572 in 1929.

Production of salt cake in Argentina, by two producers, totals 600 tons annually. Present operations are on a very small scale, in view of the limited demand.

Official reports for 1928 indicate the existence in Spain of 23 sulphate of soda concessions, covering an aggregate of 1,134 hectares (2·47 acres). There is but one factory, which during 1928 produced 6,648 metric tons, and this plant is undergoing improvement.

"Science in the Kitchen"

For several years, research specialists of the Mellon Institute of Industrial Research, Pittsburgh, U.S.A., have delivered popular radio talks, broadcast from the University of Pittsburgh Studio on recent advances in science. During the past winter the series consisted of eight talks: "The Well Planned Kitchen," "The Intelligent Purchasing of Foods," "The Care of Food in the Home," "Good Proportions of Foods," "The Uses of Milk in the Home," "Good Meals for the Young Homemaker," "Food for Young Children" and "The School Lunch." These talks have now been published in booklet form under the title *Science in the Kitchen: The Selection, Care and Service of Foods*. Copies are being sold at 60 cents by the Radio Manager, University of Pittsburgh. Complimentary copies, however, may be obtained by food specialists, domestic scientists, and dietists who make direct application to the Mellon Institute.

High Superheated Steam Temperatures

Well-known London Power Station to Operate at 800° F.

The new boiler and power plant of Synthetic Ammonia and Nitrates, Ltd., at Billingham, serves to emphasise that one of the most striking features in modern steam generation practice is the increasing temperatures of superheated steam. Thus 750–850° F. is now becoming standard practice, the figure at Billingham being 858° F. Another example is the Millfields Road Station of the Hackney Metropolitan Borough Council, which is to be extended by the addition of two 30,000 kw. turbo-generators and six boilers. For the first half of this equipment, that is, one turbo-generator and three boilers, the main contractors for the steam plant are Simon-Carves, Ltd., Manchester. The boilers, of the semi-vertical tri-drum type will each have a normal evaporation of 125,000 lb. per hour, and 150,000 lb. maximum, operating at 400 lb. pressure and 800° F. superheated steam temperature, that is 360° F. of superheat. The firing is by Underfeed "Type L" travelling grate stokers and the superheaters are of the "M.L.S." single-pass, multiple loop, intertube type, designed and constructed by the Superheater Co.

There are many other high temperature steam boiler plants operating or under construction in Great Britain with this type of superheater, the following being some notable examples:—Walsall, West Midland Joint Electricity Authority (760° F.), Hull Corporation (775° F.), Leicester Corporation (760° F.), Leeds Corporation, Kirkstall Station (750° F.), Sheffield Corporation (800° F.), Neasden, Metropolitan Railway (750° F.), Barking, County of London Electricity Supply (765° F.), Scarborough Corporation (750° F.) and Leicester (760° F.). Also various low temperature carbonisation plants are equipped in the same way, giving steam at 900–1200° F. as a heating medium, of which examples are the "Turner" plant at Coalburn, Lanarkshire, and the "K.S.G." installation at the South Metropolitan Gas Works, London.

In the "M.L.S." superheater one of the essential features is the employment of the single-pass principle in which a series of long multiple-loop elements, of comparatively narrow diameter, are connected in parallel between the saturated and superheated steam headers. This gives uniform steam distribution at all ratings, with high velocity and consequent freedom from local overheating, the single pass elements being made to give any desired travel by uniting the necessary number of lengths of tube by integral forged return bends, which are stronger than the tube itself. It is claimed that the results thus obtained are superior to any system of oxy-acetylene or electric welding, where the results depend on the personal skill of the operator, and a smooth uniform internal tube surface at the weld cannot always be ensured. Another valuable feature also is the flexibility in design made possible by such multiple-loop construction, so that the superheater is easily adaptable to varying conditions of space, operating pressures and temperatures, and methods of firing.

It is because of these features that it is possible to use low carbon steel superheater elements for conditions up to about 850° F. or slightly over, although until quite recently 750° F. was regarded as the limiting temperature.

Crude Oil from Canadian Tar Sands

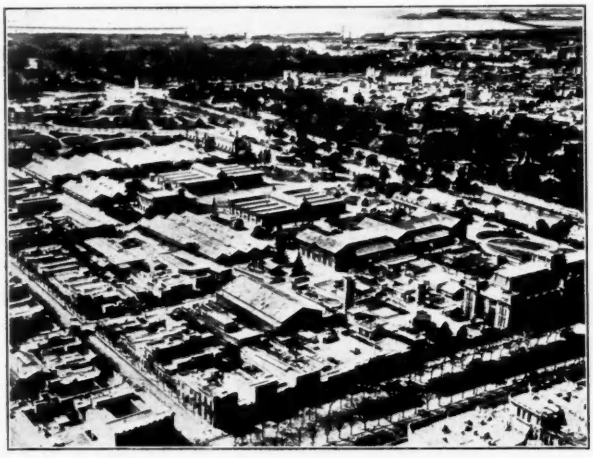
The National Research Council of Canada publishes in the June issue of the *Canadian Journal of Research*, a paper by E. H. Boomer, Assistant Professor of Chemistry, University of Alberta, and A. W. Saddington, Research Assistant, Research Council of Alberta, entitled: "On the Hydrogenation of Bitumen from the Bituminous Sands of Alberta." As the result of experiments which have been conducted by the authors, it has been established that bitumen from Alberta tar sands, hydrogenated at high temperatures and pressures, will form a light crude oil amounting under favourable conditions to 80 per cent. or more of the original bitumen. It is believed that this yield can be increased by the use of more efficient apparatus. The optimum temperature was in the region of 380°C., and the best catalysts used were ammonium molybdate and aluminium chloride. An absorption of hydrogen equivalent to 3 per cent. by weight of bitumen was easily attained. The oil had a sulphur content equal to about one-half that of the bitumen; it is easily refined to produce a stable white gasoline.

The British Exhibition at Buenos Aires

Our Chance to Recapture Trade

Arrangements are now nearing completion for the British Empire Trade Exhibition to be held in Buenos Aires from March 14 to April 27, 1931, when it is expected that buyers will be attracted from the whole of South America. The following article reviews the remarkable opportunities which the Exhibition offers to British trade.

THE announcement that the Prince of Wales, its patron, intends to be present at the British Empire Trade Exhibition in Buenos Aires in March and April next year has given great pleasure in the Argentine, where the visit paid by His Royal Highness in 1925 is remembered with the utmost satisfaction. It was, of course, shortly afterwards that the British



AIR PHOTOGRAPH OF THE ARGENTINE RURAL SOCIETY'S GROUNDS AT PALERMO PARK, BUENOS AIRES, WHERE THE EXHIBITION IS TO BE HELD.

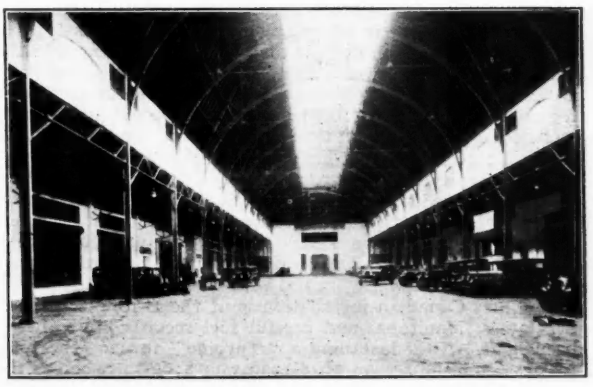
Legation was raised to the status of an Embassy, so strengthening the friendship which has long been traditional between the two countries. Since that date, also, the Argentine Rural Society has adopted the motto, "Buy from those who buy from us," a significant gesture from what is undoubtedly one of the most progressive institutions in the Republic.

The South American Market

The Buenos Aires Exhibition affords a unique opportunity for British exporters and manufacturers. The South American market, in which our goods were formerly supreme, has been largely captured by foreign competitors during recent years. The United States, in particular, has completely outstripped us in the newer trades, such as motors and wireless, and the time has come to show emphatically that Great Britain can supply all the needs of the Argentine. The Exhibition will open under the most favourable auspices. Twenty-six acres of ground at Palermo Park have been lent for the purpose, and the response of the Argentine interests has been so marked that the British Government is to treble its original contribution to the costs. Ninety per cent. of the space available is already booked. Additional pavilions are being erected to house the motor and aircraft exhibits, as the 20,000 sq. ft. originally allocated has proved insufficient. The big demand in these trades is not surprising, as the British Government will stage what is believed to be the largest collection of aircraft yet shown in any country. An aircraft-carrier will be stationed in Buenos Aires harbour, to give demonstration flights, and it is possible that the "Eagle" will be selected for this purpose. The vessel is known throughout the Argentine as having rescued Señor Franco, the first airman to fly from Europe to South America, and its appearance near the Exhibition would be an important attraction. One of the effects will be to illustrate the progress of British science, as there is an impression in the Argentine that other countries are leaving us behind in research. This entirely erroneous idea was drawn attention to by Sir Herbert Gibson, chairman of the British Chamber of Commerce at Buenos Aires, when the Exhibition was originally proposed.

Fortunately there is no lack of information on South American trade. Up-to-date details have been provided by the Economic Mission led by Lord D'Abernon last year, and more recently the Sheffield steelmakers have sent their own deputation to investigate the market at first hand. It may be well to enumerate some of the points which the D'Abernon Commission suggested. In the first place, the British manufacturer has, it is alleged, failed to keep abreast of the newer requirements of the Argentine. In the provision of railways and shipbuilding our enterprise remains unchallenged, but others are taking the place that might be ours in aviation, agricultural machinery, road construction, tractors and motor transport. Owing, no doubt, to a reputation for quality and to having been the first in the field, the British manufacturer may have failed to some extent to adapt his products to changed conditions. Too often there has been adherence to what Great Britain thinks good, to the exclusion of what South America wants. Defective salesmanship in recent years is attributed among other factors to inadequate advertisement, inadequate showrooms and inadequate range of choice. It is not fully realised that personal influence is the key to business success in South America, where also customers are especially attracted by widespread publicity. "If we are to maintain our place it is indispensable to take national interests into account and to keep ourselves well to the front, not only in point of efficiency but also in point of view."

All these remedies can be put into effect successfully through the forthcoming exhibition. The value of advertisement and publicity meanwhile cannot be too much emphasised. The date of the exhibition happens to coincide with the fiftieth anniversary of the Spanish Edition of *The British Trade Journal*, which was founded in 1881. During half a century this publication in the Spanish language has carried the flag of British trade throughout the Spanish-speaking world, and not a little of the success of our commercial relations with the Argentine has been due to its influence. It is, perhaps, not necessary to say that the enterprise of the 'eighties in providing the country with more railways was accompanied by extensive propaganda in the pages of the Spanish Edition, an example which the newer trades of motor and radio manufacture will do well to follow to the greatest possible extent, especially at a time when the Exhibition is attracting world-wide attention.



INTERIOR OF A PAVILION AT THE EXHIBITION.

Important Openings

There are many opportunities to capture new markets in South America. In the radio trades some progress is already reported by British firms, but owing to the vast size of the continent, the possibilities are far from exhausted. In the use of British aircraft, the opening is equally important, while increased activity is expected in the old-established trades. Argentine industries have been steadily expanding during recent years, but British interests have shown notable

enterprise in establishing their own local factories. These concerns prefer to order their machinery requirements in the United Kingdom, and it is worthy of note that the powerful body known as the Argentine Industrial Union declared recently that "we want to buy from Great Britain everything we do not produce ourselves." Among the urgent needs of the country is a comprehensive system of elevators throughout the grain-growing areas, and British participation in finance and contracts would be welcome to the Argentine Government. Another field for development is offered by the gas industry, which is making rapid strides. In one important area the sales of gas have increased from £6,000 to £100,000 in the past four years, a third of this supply being distributed by a British company. There is obviously great scope for business in gas appliances, and it is estimated that the sale of gas is increasing more rapidly in the Argentine than in any other part of the world.

Perhaps the biggest opportunity is offered by the new era of transport which is about to open with the construction of roads. It would be most appropriate if Britain could do something for the country in this direction, comparable with what was done for the railways. There are obvious opportunities for the sale of road-making plant and materials, and a greatly increased demand for motor vehicles of all classes will follow in the near future.

Taking place in the capital of the Argentine, the Buenos Aires Exhibition will attract buyers from the whole of South America. As in the case of the Argentine, there are many trade openings in other parts of the continent. Brazil, for example, is twice as large as India, and an area four times the size of France enjoys a temperate climate. In a country so abundantly supplied with water power there is a big future for electricity, and especially as applied to railway development. Only one important line in Brazil is at present electrified. Another large development is probable in the coastal transport system, and here also there is unlimited scope for British enterprise.

Smaller Boiler Plant Efficiency

Four Notable Examples

THE great attention being given to the advances in steam generation practice, such as, for example, the Synthetic Ammonia and Nitrates plant, is perhaps rather apt to obscure the important fact that considerable economies, often with very little capital expenditure, are waiting to be effected in even the smallest boiler plant, especially as regards the burning of low-grade fuel.

As showing what is being accomplished with this type of boiler plant, of which many examples are to be found in the chemical industries, four examples may be mentioned from Lancashire, Manitoba, Quebec, and Assam respectively, with regard to "turbine" forced draught steam jet furnace installations. The first is at the works of Entwistle and Kenyon, Ltd., of Accrington, makers of the well-known "Ewbank" carpet sweeper and other appliances. In this particular case the furnace was installed on a guarantee of saving, and the firm were so satisfied with the results that they paid for it considerably before the period agreed upon, the plant being one "Lancashire" boiler. The fuel is wood chips and other refuse material from the works, mixed with coal.

The first Canadian installation is at the Britannia School, St. James, Manitoba, and careful fuel records have always been kept. After installing a "Turbine" furnace the total fuel cost for the season 1928-1929 was $766·77, whereas the previous season, with ordinary bars, was $1,477·74, that is, a saving of $700·97, about 50 per cent. of the total fuel bill, and presumably in this case lignite is being used. Secondly, the Hart Battery Co., of St. Johns, Quebec, have a "Turbine" furnace installation burning Welsh anthracite dust, an extremely difficult fuel, with excellent results, and incidentally it may be noted that British anthracite is now competing more and more in Canada with the Pennsylvanian variety.

Finally, the installation in Assam is at one of the tea plantations of the Assam Co., Ltd., who have seven plantations, fitted on two "Lancashire" boilers. The forced draught enables coal dust, cinders, and other low-grade fuel, including vegetable refuse, to be used to the fullest extent, resulting in substantial economy, a considerable amount of steam, of course, being required on tea plantations.

Revival of Phosphate Mining in Canada

Interested Inquiries from Europe

CANADA possesses deposits of crystalline phosphate of lime, or apatite, that are probably the most extensive known, Norway being the only other country believed to possess important resources of this material. Analyses of clean lump Canadian apatite show it to carry about 85 per cent. of tricalcic phosphate. It is a fluor-apatite, as contrasted with the Norwegian mineral, which is chlor-apatite, and it contains about 3 per cent. of fluorine.

The Canadian phosphate bodies are found in two main districts, one in Quebec and the other in Ontario, and both near Ottawa. The deposits formerly were systematically mined and have yielded a total recorded output of over 300,000 tons, most of which was utilised in the manufacture of superphosphate, but these operations virtually came to an end about 1895 with the discovery, in other parts of the world, of enormous bodies of sedimentary phosphate which could be mined much more cheaply. Almost all of the small tonnage of apatite produced in Canada during the past twenty years has been obtained as a by-product of mica-mining operations, and most of it has been utilised locally in the manufacture of phosphorus and fertilisers.

Possible Metallurgical Use

Although Canadian apatite cannot offer any commercial possibilities at the present time as a raw material for the fertiliser industry, which consumes the bulk of the world's phosphate output, it is of interest to note that during the past year the Mines Branch has received an unusual number of requests for information relating to the deposits and the practicability of obtaining a supply of Canadian apatite. Little indication has been given by correspondents as to the purpose for which the mineral might be required, though one inquiry suggested a possible use in the metallurgical industry. In addition to the inquiries on this subject received directly by the Mines Branch, it is understood that interest in Canadian apatite has been evinced during the past year by at least one important European corporation engaged in the chemical industry, and that an examination of various properties had been projected.

This renewed interest in Canadian phosphate occurrences suggests the possibility that crystalline apatite may prove superior to rock phosphate for certain purposes, and that if this superiority is decided enough to warrant the higher price being paid, a revival of the Canadian apatite mining industry may follow.

Beds of sedimentary phosphate rock in the Crowsnest Pass district of the Rocky Mountains, just west of the Alberta-British Columbia boundary, have recently been investigated by the Consolidated Mining and Smelting Co. of Canada. These deposits consist of phosphatic shales and limestone and are favourably situated in respect to rail transportation. The run-of-mine rock is reported to average around 50 per cent. tricalcic phosphate, and the main bed to range in thickness from 3 to 12 ft. A small tonnage of the phosphate has been mined and shipped to the company's works at Trail, B.C., for experimental purposes in the manufacture of triple superphosphate, and the results are reported as so satisfactory that a large unit is being erected for the manufacture of this product.

A detailed Report (No. 396: "Phosphate Resources in Canada") on the apatite deposits of Canada was published by the Mines Branch some years ago, and copies may be secured by application to the Director, Mines Branch, Department of Mines, Ottawa, or to the Acting High Commissioner for Canada, The Canadian Building, Trafalgar Square, London.

Fertiliser Propaganda for French Indo-China

THE agricultural service of Cochin China is waging an active campaign to develop the use of fertilisers in the cultivation of rice. Pamphlets in the native language and posters are being used, as well as lectures given in the principal rice-growing centres. In eleven Provinces numerous experimental fields have been chosen, the soil analysed, and the appropriate fertilisers prepared. In addition, other trials are to be made in conjunction with the agricultural syndicates and several commercial houses of Saigon. In the trials of fertilisers in the rice fields the superphosphates and the phosphates of Tonkin are said to have regularly given good results, but their application in large quantities is not recommended.

The Commerce of Chemistry

By J. N. Taylor

The following extracts are taken from an address delivered by Mr. Taylor (of the Chemical Division, U.S. Bureau of Foreign and Domestic Commerce) recently before the Virginia Section of the American Chemical Society.

THE necessity for a larger knowledge of economic conditions as they affect the chemical industry has evolved a new order of workers made up in larger measure of those possessing both commercial and chemical training. It has introduced a new chemist classification. Perhaps it may not be necessary for the chemical marketing specialist to have a chemical training, but basic knowledge of chemical science and its nomenclature should be extremely helpful in considering the fundamental aspects of chemical processes, the relation of one product to another, the possibilities for new and more efficient applications of them, as well as a more intelligent understanding of economic and commodity trends. Through these influences and trends, chemistry is recognised as basic to all industry, and chemical industry to-day exercises a profound influence upon the political economy of the world.

Economic Trends

Economic trends or commodity tendencies may be caused by several factors, among which may be noted (1) the influence of other industries upon chemical evolution, and (2) the intrusion of synthetics into fields of use already occupied by natural products. To these factors of outstanding interest to the chemist may be added (3) those of availability of natural resources, and (4) waste and co-product utilisation.

Consider how the automobile has affected chemical trends. It has caused a demand for more durable materials, for new and brighter colours, and new and better protective coatings. These latter have demanded solvents answering certain exacting specifications. The automobile industry is responsible for the development of anti-knock agents used as motor fuel constituents embracing a variety of substances useful for that purpose. Increased production of artificial leather followed the greater output of motor cars. This greater output was also reflected in a larger consumption of synthetic resins. Another industry that has affected the trend of certain chemical commodities is the rayon industry. Rayon—itself a group of chemical compounds—has exercised an influence over cellulose and the acids, both nitric and acetic. The demand for acetic acid, for instance, increased to such an extent that calcium acetate had to be imported to satisfy the demand for the raw material despite a continued growth in synthetic production as well.

Not so long ago the number of synthetics entering into competition with natural products was small, but the rapid progress in chemical discovery adds new ones to the list almost daily. Ammonia, acetic acid, methanol, ethanol and the aromatics are just a few. Glycerine is confronted with glycol, and butyl alcohol faces internal dissension. Citric acid from fruits faces the constructive activities of the molds. The scene of natural camphor production will quite probably shift from the wild highlands of Formosa, where live the head-hunting savages, to more refined scenes of synthetic production.

Utilisation of wastes and collateral products is constantly changing our ideas as to what are main products and what are by-products. Once, kerosene was the principal product of a petroleum refinery; now, the situation is reversed. Hydrochloric acid at one time was allowed to escape as a waste gas. Uses found for it soon made it a main product. The oils obtained from by-product coke ovens are to-day in as great demand as the residual product of distillation. Chemical history is replete with these reversals in relative economic importance of manufactured products.

Increasing Scope of Chemical Industry

The consequent appearance of new products and the larger application of both old and new ones, has brought about a situation not comparable with that of any previous period in history. The incidence upon life of enormous quantities of materials having manifold uses must be characterised as truly great.

The magnitude and scope of chemical industry to-day is tremendous when compared with that of a hundred years ago, even indeed within the past quarter of a century. A comparison of the 1899 production figures with present day ones will afford an idea of how far we have travelled since that time. Consider just a few outstanding examples:

	1899	1927	
Acetic acid	$400,000	$5,500,000	(for sale)
Nitric acid	1,500,000	3,500,000	,,
Sulphuric acid.....	7,300,000	43,000,000	,,
Mixed acids.....	1,100,000	3,800,000	,,
All sodas and compounds	11,600,000	114,000,000	
Alums	2,400,000	9,500,000	
Cyanides	1,600,000	6,300,000	
Fertilizers	42,000,000	190,000,000	
Paints and varnishes..	54,000,000	500,000,000	
Explosives	17,000,000	72,500,000	
Plastics	2,100,000	28,000,000	

Sulphur in the 1899 figures included pyrites, and production aggregated a value of $543,249 dollars. 1927 production of sulphur alone was valued at over $38,000,000. Rayon, first exhibited at the Paris Exhibition in 1889, is now a firmly established industry, the total United States production in 1927 amounting to $110,000,000. Medicinal and toilet preparations, crude drugs, essential oils, waxes, matches, and a multitude of other commodities have also seen a remarkable development.

Synthetic Organic Industry

We cannot leave this discussion of the rise of the American chemical industry, however, without mentioning a branch constituting a key industry and occupying an important position in the chemical life of the nation—the synthetic organic chemical industry. In 1880, when the first mention was made in the census returns of coal tar dyestuff manufacture, production amounted to 80,518 pounds of aniline dyestuffs. Expansion since the World War presents a magnificent record, preliminary figures for 1929 indicating the production of domestic dyes to have been approximately 110,200,000 pounds. Production of organic photographic chemicals totalled 581,000 pounds; synthetic flavours, 2,290,000 pounds; synthetic perfume materials, 1,596,000 pounds; synthetic phenolic resins, 31,471,000 ,and synthetic coal-tar medicinals, 5,000,000 pounds. An industry that can offer to purchase for a country, with one of its secret remedies, great areas in the tropics is not an industry to be neglected. The saturation point is not in sight. Production is limited only by human needs and desires, and our economic horizons are constantly being pushed back in order to supply the rational cravings of teeming millions not yet acquainted with modern necessities, to say nothing of some of the luxuries.

Chemistry in the Future

The functions of chemistry in the future must be more comprehensive than at present and must certainly embrace an understanding of its economic importance. The service of chemistry must be not only in the discovery and the application of scientific and technological facts, but chemistry must also serve by solving the larger problems of distribution in its broadest sense. We must lay more emphasis upon the commerce of chemistry, upon the economical distribution of chemical wares. New uses must be found for old products, old industries may justify expansion, and new ones would logically be inaugurated if deemed advisable. It is not enough to visualise the great potential awaiting development—to view the perspective—and stop at that. Practical and efficient methods for bringing about the desired ends must be formulated and, happily, chemical industry itself, as well as governmental institutions, have made a beginning along this line.

A general method of approach, capable of specific application, of arriving at a programme of effort, is through the chemical-economic survey. In building the survey structure the technique to be followed will, of course, depend upon the problem at hand, but no matter what the survey, whether of some particular branch of industry or of some particular commodity or group within the industry, the foundation upon which the superstructure is to be raised must consist of immediate, reliable, adequate and permanent records.

Chemical Trade of Czechoslovakia

Downward Trend in Second Half of 1929

THE Report presented at the recent annual general meeting of the Union of Chemical Manufactures of Czechoslovakia states that following the steady upward economic trend throughout 1927 and 1928, the year 1929 produced in Czechoslovakia, as in most other European countries, a retrograde movement which was particularly emphasised from July onwards. As the chemical industry proper provides raw materials for most other branches, the general economic trend was reflected in the development of chemical sales. These showed a decided downward tendency in the second half of the year. Some branches of industry, such as the glass, cellulose, iron and metal working branches proved able to make good to some extent in increased exports the ground they lost in the home market, and in these cases purchases of chemicals were fairly well maintained though even here they were below the level of preceding years. On the other hand there was a decided regression in chemical purchases for the textile and leather trades. In order to counteract these circumstances, to some extent at least, chemical manufacturers had to take up the output of various species of chemicals hitherto imported. Hand in hand with failing markets went a drop in prices and a deterioration of conditions of payment. The conditions in respect of artificial fertilisers were particularly unsatisfactory.

80 Per Cent. of Output Exported

The chemical industry in Czechoslovakia comprises altogether some 670 establishments and gives employment to upwards of 45,000 workers. About 80 per cent. of the total output is exported. The value of the exports, inclusive of by-products, is over 200 million crowns per annum, while imports amount to over 400 millions.

The industry dates from as early as the seventeenth century, and in the second half of the eighteenth century sulphuric acid manufactured in Bohemia was exported into many parts of the world. Since the establishment of an independent Czechoslovakia in 1918, considerable progress has been made in developing this industry. Its main centres are at Usti (Aussig) on the Elbe and elsewhere in the north-west of Bohemia and at Kolin, at Ostrava in Moravia, and in Slovakia. The following *résumé* of the more important of recent developments is taken from the official United States *Commerce Reports*.

Conspicuous is the development of fixed nitrogen, produced by a direct ammonia synthesis since early in 1928 by the Czechoslovak Nitrogen Works in Moravská Ostrava, and by the synthetic plant of the Aussiger Verein, at Aussig, making technical nitrogen salts only. Although the plant at present produces only 30 tons of ammonia daily of an expected 60 tons, part of which enters ammonium sulphate, this concern proposes to develop certain nitrate salts, starting with nitro-chalk (ammonium nitrate and calcium carbonate), to break the tide of Chilean saltpeter imported perforce for fertilisation of the local beet, potato, and grain crops. Nitrogen is fixed also by the Aussiger Verein at its cyanamide plant at Falknov, producing at the rate of about 30,000 tons of the finished product annually. It also contemplates a lignite-distillation and tar-cracking process to tie up with it cyanamide plant.

Along with its fertiliser nitrogen, the Czechoslovak Nitrogen Works are supplying the Czechoslovak Explosives Works (industrial and military explosives monopoly) with ammonia, while the latter, with its associated "Synthesia" plants at Semtín near Pardubice, is further developing production of nitric acid and nitrates for technical use.

Production of Acids

Czechoslovak production of other mineral acids, notably sulphuric, is on the increase. Capacity for the sulphuric-acid production was increased last year, and the 10 local superphosphate enterprises now can meet home requirements for this important fertiliser, even if Czechoslovakia still imports some superphosphate by international agreement. Likewise, production of soda ash increased, over 90,000 tons having been produced against a capacity of 100,000 tons in 1929.

Without fertiliser potash from domestic sources, this country has, however, a sizable industry making potassium carbonate from wastes in the sugar and spirits industries. Likewise, local producers are penetrating more the field of production of the organic acids, including formic ,oxalic, citric, lactic, and salicylic. Acetic-acid production is self-sufficient, with export capacities, along with the other products of destructive wood distillation, originating in ancient plants located on the hardwood forestral reserves of Carpathian Ruthenia, formerly Hungary. This branch, however, has lost former export markets in view of synthetic development abroad.

Production of coal tar shows a progressive increase, having attained 130,000 metric tons in 1929. This material is processed by the firm of Julius Ruetgers of Moravská Ostrava, connected with the Ruetgers Co., of Berlin, Germany. Another source of unique wealth for the pharmaceutical (and colours) branch primarily is the occurrence of pitch blends or uranium ore at Jáchymov in northwest Bohemia. The ore is partly reduced to radium chloride, the latter being used by at least two pharmaceutical producers to make so-called radioactive therapeutic preparations.

Commercial Use of Anhydrite

Recent Canadian Research

ANHYDRITE, the anhydrous calcium sulphate, has been considered for many years to be of little commercial value, and when encountered in the mining of gypsum has usually been considered as an impurity and discarded. Recently, however, attempts to find commercial uses for anhydrite have produced such encouraging results that the mineral promises to become an article of considerable industrial importance. The successful development of further uses for anhydrite is of great importance to Canada, as large deposits of the mineral are found associated with gypsum in Nova Scotia, New Brunswick, Ontario, Manitoba, Alberta and British Columbia, and at many of the gypsum quarries in these provinces large quantities of anhydrite have already accumulated.

At present, approximately 5,000 tons of anhydrite are shipped from Nova Scotia each year to the southern areas of the United States which border on the Atlantic seaboard, where it is ground and used as fertiliser for the peanut crops. In England and continental Europe considerable tonnages of anhydrite are used in the making of ammonium sulphate for fertiliser purposes. Recent investigations in the United States and elsewhere have demonstrated that it is possible to use as much as 50 per cent. anhydrite with gypsum as a retarder for Portland cement.

However, the greatest interest has recently centred in the use of anhydrite for the manufacture of commercial plasters, and many patents have been filed in Canada, the United States and Europe in which anhydrite forms the base for such plasters. The pioneer work in this line in Canada has been carried on by Professor A. E. Flynn, Professor of Mining Engineering at the Nova Scotia Technical College, Halifax, N.S., and his report entitled "Anhydrite Plasters and Cements," published by the Department of Public Works and Mines, Halifax, Nova Scotia, shows that plasters made from anhydrite, with the addition of varying small proportions of certain chemical salts as catalysers, would "set" and in a number of cases produce a tensile strength comparable to many gypsum plasters now on the market.

The Mines Branch, Department of Mines, Ottawa, is now engaged in an investigation of the anhydrite deposits of Canada with a view to determining the extent of the deposits and the chemical and physical characteristics of the rock from different localities, and laboratory tests are under way at Ottawa carrying on the work started by Professor Flynn at Halifax.

Lord Melchett's Visit to America

Transatlantic Interests of I.C.I.

LORD MELCHETT left in the "Majestic" on Wednesday for a short business visit to the United States and Canada with Sir Harry McGowan. The main purpose of the tour is to attend to various important interests with which Imperial Chemical Industries is connected in the States and Canada, and Lord Melchett, who is chairman of the Advisory Committee of International Nickel, intends to inspect the new plant of that company in Ontario—the greatest undertaking of the kind in the world—which has been opened since his last visit.

Lord Melchett will do some public speaking while he is in Canada, and he has arranged to address a meeting of the Canada Club in Montreal on September 3.

Chemistry in Sculpture

Symbolic Figures for I.C.I. Building

MR. CHARLES S. JAGGER, A.R.A., sculptor of the Artillery Memorial at Hyde Park Corner, the British memorial to Belgium in Brussels, and other famous works, has just completed the first of a set of four symbolic groups which are to decorate the Imperial Chemical Industries building on Millbank. This first group is in position, 60 ft. from the ground, at the corner of Horseferry road and Millbank.

"The four groups," said Mr. Jagger, in an interview, "are to be symbolic of four staple industries of this country, namely, Agriculture, Chemistry, Marine Transport, and Modern Building Construction. It is the last of these which I have completed, after eighteen months' work. It represents the builder, supporting with a chain a section of steel girder upon which stands a representation of the modern world in miniature in the form of typical present-day buildings." The idea is that the steel girder is the core of all modern building, having replaced the stone and wood of the past.

"I am now working on Marine Transport. This will be the figure of a stevedore releasing the anchor-chains of a fleet of cargo ships. Chemistry, upon which I will probably be working next, shows a figure of the chemist forcing open the hand of Mother Earth and compelling her to release her secrets for the benefit of mankind. Agriculture will be symbolised by the four essentials of its operation, the Land Worker, the Sun, the Rainbow, and the Earth."

Each of the groups will be about 12 ft. high. The Chemistry group is to be set up on the Horseferry Road frontage, the other two on the Millbank front. It is not possible to say how long it will be before the whole scheme is completed, but Mr. Jagger is concentrating on this commission to the exclusion of all other work.

British Colour Council

Co-ordinating Empire Interests

THE British Colour Council, Ltd., was registered on August 16, as a company limited by guarantee without share capital, and with an unlimited number of members each liable for £5 in the event of winding-up. The objects are to place the determination, co-ordination, and propagation of colour tendencies for fashion, allied and other trades in the British Empire in British hands; to provide the manufacturers, distributors and other bodies or corporations of all or any particular trades and other approved persons, with advance, authoritative and other information in regard to the colour tendencies of all or any such particular trades and to co-ordinate and standardise the names and numbers of colours used in connection with the said trades in the British Empire and abroad; to conduct research connected with colour; to arrange and promote the adoption of colour nomenclature, shade cards, equitable forms of contract and other documents used in the trade, etc.

The subscribers include Mr. W. Rhodes, director of the Leeds and District Worsted Dyers' Association; Mr. J. Sharp, director of the Bradford Dyers' Association, Ltd.; Mr. W. H. Watson, chairman of Lister and Co., Ltd.; Mr. C. B. Gwynne, director of the Bradford Dyers' Association, and Mr. J Rogers, a director of Imperial Chemical Industries, Ltd.

Swedish Imports of Acetone and Acetone Oil

IMPORTS of acetone and acetone oil are classified together in Swedish official statistics. From the following table it will be noted that in 1928, the latest year for which complete data are available, the value of these imports showed an increase. The imports from Germany showed the greatest gain, and England also has become an important foreign source of supply. The figures (from a U.S. source) are :—

	1926	1927	1928
Denmark	$275	$3,077	$2,521
Great Britain	2,800	7,075	8,048
Germany	47,979	55,204	87,127
Netherlands	853	—	—
United States	11,560	8,134	10,472
Other countries	258	90	24
	63,725	73,580	108,192

Imperial Chemicals Interim Dividend

A Reassuring Progress Report

THE following interim dividend announcement and progress report was issued on Wednesday by Imperial Chemical Industries, Ltd. :—

"The directors of Imperial Chemical Industries, Ltd., have declared as at August 27, 1930, in respect of the trading year ending December 31, 1930, an interim dividend of 3 per cent. actual on the issued ordinary capital of the company. This dividend will be payable (less income-tax at 4s. 6d. in the pound) on October 8, 1930, to shareholders on the register on August 27, 1930. For the purpose of the payment of this interim dividend, the register of ordinary shareholders will be closed from August 27, 1930, to September 10, 1930, both dates inclusive.

"The directors are pleased to be able to report that, in spite of the fact that widespread depression in industry in the home trade, and economic disturbances in some of the more important export markets, have naturally brought about some contraction in the sales of the company's products, earnings have been relatively well maintained. As far as can be foreseen, there is no reason to anticipate that the results for the second half of the year will materially differ from those of the six months to June 30 last. The associated companies in Canada, South Africa and Australia continue to develop satisfactorily.

"As has already been stated in the Press, the company has made an agreement with the synthetic nitrogen producers on the Continent of Europe and with the Chilean Nitrate interests covering the fertiliser year ending June 30, 1931. The object of the agreement, which is satisfactory to the company, is to control production and thus to stabilise the industry; the current output of the company's works will not be affected. In view of the world trade depression, the directors have every reason to be satisfied with the manner in which the chemical industry has been able to maintain its position in most difficult times."

New Benn Books

FORTHCOMING publications by Ernest Benn, Ltd., include the following :—

Australia, by W. K. Hancock. 15s. net. An opportune addition to the Modern World Series, published just before the opening of the Imperial Conference.

Advice to His Son, by Henry Percy, 9th Earl of Northumberland, 1609. Illustrated, cloth, 8s. 6d. net. A literary discovery of the first importance, giving a most intimate picture of the mind of a great Elizabethan nobleman.

The Tragedy of the Chinese Mine, by Ian B. Greig, 7s. 6d. net; *In the Admiral's Wake*, by L. I. Crawford, 7s. 6d. net; *Out of the Window*, by Madeline Linford, 7s. 6d. net; *Cynara*, by H. M. Harwood and R. Gore Browne (Contemporary British Dramatists, No. 79), cloth 5s., paper 3s. 6d.; *Modern Swedish Architecture*, by Hakon Ahlberg, 176 plates, art canvas, £4 14s. 6d. net; *My Crowded Solitude*, by Jack McLaren, 3s. 6d.; *Almayer's Folly*, by Joseph Conrad (Benn's Essex Library, No. 34), 3s. 6d.; *Home Life in History*, by John Gloag and C. Thompson Walker, 8s. 6d.; *The Story of the Treasure Seekers*, by E. Nesbit, 3s. 6d.; *Five Children And It*, by E. Nesbit, 3s. 6d.; *The Best Plays of Christopher Marlowe*, edited with critical memoirs and notes by Havelock Ellis (Mermaid Series), paper boards 3s. 6d., cloth 5s., and leather 7s. 6d. net. (reprint).

The publication of *The Old Bank of England* announced for August 29, has been unavoidably delayed.

Institute of Chemistry Register, 1930

A NEW Register of Fellows, Associates and Students, corrected to May 31, 1930, has been issued by the Institute of Chemistry from 30, Russell Square, London. It is recorded that the Institute has now a roll of nearly 5,700 Fellows and Associates, and of about 700 registered students, while local sections have been formed in seventeen important centres to foster professional interests and promote social intercourse. Close on 300 pages are devoted to the names and addresses of Fellows and Associates arranged topographically and lists of past and present officers, memorial lecturers and medallists have been brought up to date.

From Week to Week

THE HORNE ENGINEERING CO., 35, Pitt Street, Glasgow, has now become a limited company.

LEVER BROTHERS, LTD., announce that arrangements have been made under which Mr. Clement Davies, K.C., M.P., will shortly be joining their board of directors.

AN EXHIBITION of British artificial silk goods is to be held at the Albert Hall next year during the period of the British Industries Fair. Seven-eighths of the available space is already booked.

CHINA CLAY imported into Great Britain and Northern Ireland during July last amounted to 104 tons, including 38 tons (value £165) from Germany and 66 tons (value £359) from the United States.

A BOTTLE containing half a gallon of nitric acid was being carried by a messenger boy in a Newcastle Corporation omnibus on Monday when it burst and filled the vehicle with fumes. One man suffered burns to his hands.

FOLLOWING THE RECENT AGREEMENT between European artificial nitrate producers and the Chilean producers, the formation is announced from Switzerland of the International Nitrate Co. with a capital of 6,000,000 Swiss francs (£240,000).

A GOVERNMENT DECREE will shortly be published in Ceylon under the terms of which one-fourth of the outlay of the farmers on artificial fertilisers will be met by the Government. The aim of this measure is to encourage an increase of crop yields.

THE WEDDING of Dr. Alexander M'Gookin, Lecturer in Organic Chemistry at the University of Liverpool, and Miss Marjory Wathall Waugh, took place at Edge Hill, Liverpool, on Wednesday. The couple met at the University when the bride was a student.

UNIVERSITY NEWS.—*Aberdeen*.—Mr. David Campbell, M.A., B.Sc., M.D., Pollok Lecturer in Pharmacology and Therapeutics in the University of Glasgow, has been appointed Regius Professor of Materia Medica in the place of Professor C. R. Marshall, whose resignation takes effect on September 30.

A GRANT of £504 has been made by the Department of Scientific and Industrial Research to Dr. H. T. S. Britton (Lecturer in Physical Chemistry) to enable him and Dr. A. Robinson to continue their work on vanadic, columbic and tantalic acids in the laboratories of the University College at Exeter.

THE COUNCIL of the Institution of the Rubber Industry has accepted on behalf of its members an invitation from the Rubber Division of the American Chemical Society to attend its autumn meeting on September 5, 1932. A sub-committee has been appointed by the Institution and is making preliminary arrangements.

CHANGE OF ADDRESS.—The administration offices of the General Chemical and Pharmaceutical Co., Ltd., manufacturers of Judex laboratory reagents and of Oasis accumulator acid, will on Wednesday, Aug. 27, be moved to Judex Works, Sudbury, Middlesex. (Telephone: Wembley 3883; Telegrams: Chemipharm, Wembley.) The Willesden factory will, for the present, continue to operate as heretofore.

A MEETING of large shareholders of Goodlass, Wall and Co., who had been opposed to the scheme recommended by the directors for amalgamation with the Associated Lead Manufacturers, was held in Liverpool on Wednesday. After hearing the complete details of the negotiations and the prospects of the new company, they unanimously decided to support the scheme and advise all shareholders in Goodlass, Wall, to send in their proxies forthwith in favour of the scheme.

AN OFFICIAL DENIAL has been issued by General Berenguer, the Spanish Prime Minister, of the report that the Spanish Government is negotiating with "a great American oil company" for a big loan for the stabilisation of the peseta, in exchange for which it will grant the company a monopoly for the sale of its oil in Spain. The report which has been given great publicity both in Spain and the United States was that the Standard Oil Co. of New Jersey had offered the Spanish Government a loan of 1,000,000,000 pesetas (£22,750,000), interest free, in return for a Spanish oil monopoly.

A CARTEL of Belgian glass manufacturers, it is reported, has been formed in Brussels, and is considered to be a prelude to the formation of an international glass cartel.

THE CALICO PRINTERS' ASSOCIATION, LTD., have decided to close down their dyeing, finishing and printing works at Thornliebank, near Glasgow, and some 508 workers will receive notice.

DUNOON TOWN COUNCIL has denied liability for a claim made by the liquidator of the Kyle Chemical Co. for the cost of seven drums alleged to have been damaged at Dunoon gasworks in 1927.

THE INSTITUTION OF CHEMICAL ENGINEERS, Abbey House, Westminster, have now issued the papers set for the 1930 Associate-Membership examination of the Institution held in January/March and July.

BRINJES AND GOODWIN, LTD., the mixing and grinding machinery specialists, have removed their head office and works from Cold Harbour, Poplar, London, E.14, to more extensive premises at Burdett Works, Wallwood Street, Limehouse, E.14. (Telephone: East 6925 and 6926; telegrams: Blitheful, Phone, London.)

DR. DOUGLAS INGALL, Principal of Constantine College, Middlesbrough, has been appointed Assistant Director of the British Non-Ferrous Metals Research Association, and will take up his new duties in January. A short time ago Dr. Ingall was appointed Director of the Northern Polytechnic, Holloway, but the governors of that institution have allowed him to withdraw.

THE OFFER recently made to the preference shareholders of English Margarine Works, Ltd., to exchange their shares for 7 per cent. cumulative preferred shares in Unilever, Ltd., has been accepted by the holders of more than 90 per cent. of the issued preference shares. The directors of Unilever, Ltd., have now decided to complete the exchange by the issue of the appropriate number of Unilever, Ltd., preference shares.

THE HOME SECRETARY, it is announced, proposes to make a welfare order applying to all workers employed in cane and beet sugar factories. The main requirements of the Order are the provision and maintenance by the occupier of suitable messroom and cloakroom accommodation and washing facilities, and baths for workers employed in hot, dirty or sticky processes. Copies may be obtained on application to the Home Office.

THE MARKET for disinfectants, insecticides and animal dressings in the Republic of Honduras is the subject of a confidential report prepared by the Department of Overseas Trade from information furnished by H.M. Chargé d'Affaires at Tegucigalpa. United Kingdom firms desirous of receiving a copy of this report should communicate with the Department at 35, Old Queen Street, London, quoting Reference No. B.X. 6,688.

RECENT WILLS include Sir Robert Harvey, of Dundridge, Totnes, Devon, chairman of the Antofagasta and Bolivia Railway Co., Ltd., the Arauco Co., Ltd., the Buena Ventura Nitrate Co., Ltd., the Lagunas Syndicate, Ltd., the Liverpool Nitrate Co., Ltd., and the Nitrate Railways Co., Ltd., and a director of a number of other companies, aged 83 years. Mr. R. F. Watson, cashier of Cunningham, Ltd., chemical manufacturers of Leith, personal estate £9,156. Mr. Thomas George Phillips, of Castleford, Yorkshire, chief engineer at the chemical factory of Hickson and Partners, Castleford (net personalty £956), £1,452.

Obituary

M. JOSEPH ACHILLES LE BEL, For. Mem. R.S., a former president of the French Chemical Society, on August 8, aged 83.

MR. BERNARD H. CROOKES, civil engineer, and eldest son of the late Sir William Crookes, the scientist, on August 15, aged 65.

MR. SAMUEL PARRY, of New Ferry, Cheshire, for 34 years in the employ of Lever Brothers, the greater part of the time as a foreman in the chemical department, on August 14, aged 63.

SIR WILLIAM WALKER, late director of Health and Safety in the Mines Department of the Board of Trade, and formerly Chief Inspector of Mines at the Home Office, on August 17, aged 66.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

330,715. MAGNESIA. Kaliforschungs-Anstalt Ges., 5, Schönebergerstrasse, Berlin. International Convention date, January 12, 1929.

Magnesium hydroxide, from which the oxide is obtainable, is prepared from kieserite, kainite, and other natural or artificial mixtures containing magnesium salts by saturating more or less completely with gaseous ammonia in presence of water without the application of heat. In the case of kieserite, magnesium hydroxide, ammonium sulphate and some anhydrite are formed, and the constituents of the mixture are separated by decantation or washing with the reacting liquor to produce the pure hydroxide, and a solution of ammonium sulphate which may be worked up. The treatment with the reacting liquor also precipitates any potassium sulphate present. When the decantation process is applied to the potassium magnesium sulphate mixture of commerce, using a saturated solution of ammonium sulphate and potassium sulphate, after saturation with ammonia, there are obtained magnesia and an equimolecular mixture of potassium and ammonium sulphates applicable as a manure.

330,893–4. HYDROXY-ARYL-METHANES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 14, 1929.

330,893. One molecule of an aromatic aldehyde other than oxyaldehydes and their sulphonic, carboxylic and sulphocarboxylic acids, is condensed with two molecules of a *p*-alkylated phenol having a free ortho position. Phenols substituted with groups not capable of forming salts, but having a free ortho position may be employed. Acid condensing agents such as sulphuric acid, zinc chloride, or mixtures of hydrochloric and glacial acetic acids may be used. The products are *o*-hydroxy-triaryl-methanes, and are employed for moth-proofing wool, fur, etc., in the form of a solution in an organic solvent, or by addition to the dye bath. In an example, *p*-cresol or *o*-chlor-*p*-cresol is condensed with sodium benzaldehyde-*o*-sulphonate. Other components mentioned include chlor-benzaldehyde, naphthaldehydes, *as*-*m*-xylenol, and phenols with higher alkyl groups in the para position.

330,894. One molecular proportion of an aldehyde, except aromatic oxy-aldehydes and their sulphonic, carboxylic, or sulpho-carboxylic acids, is condensed with two molecular proportions of a phenol, containing a halogen atom in one or both meta positions but unsubstituted in the paraposition, in the presence of acid condensing agents such as sulphuric acid, zinc chloride, or a mixture of hydrochloric, and glacial acetic acids. The products are employed for moth-proofing. Examples are given of the condensation of *m*-chlor-phenol, or 6-chlor-2-cresol, with formaldehyde, and 2 : 5-diachlor-phenol or 6-chlor-2-cresol with sodium benzaldehyde-*o*-sulphonate, Other components mentioned include chlorbenzaldehydes. naphthaldehydes, 4-chlor-2-cresol, 2 : 5-dibrom-phenol and *m*-chlor-guaiacols.

330,904. SULPHONATED HYDROXY FATTY ACIDS. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 18, 1929.

Higher unsaturated hydroxy fatty acids such as ricinoleic acid or their esters such as castor oil are treated with gaseous sulphur trioxide, while stirring and cooling in the presence of an organic diluent such as carbon tetrachloride, perchlorethane, hexachlorethane, or trichlor-ethylene. The sulphur trioxide may be employed in a current of dry inert gas such as air or nitrogen. The acids or esters may be first treated with sufficient sulphuric acid monohydrate or chlorsulphonic acid to esterify the hydroxy groups, and then with gaseous sulphur trioxide.

330,911. INSECTICIDES. Sir G. C. Marks, London. From Rohm and Haas Co., 40, North Front Street, Philadelphia, U.S.A. Application date, March 13, 1928.

Monochlor-acetyl compounds having a vapour pressure lower than that of butyl-monochlor-acetate are dissolved or dispersed in liquids, *e.g.*, hydrocarbon oil or water, at dilutions of 1/75 to ½ gram molecule per litre. The compounds employed preferably contain additional chlorine atoms or nitrogen atoms. Suitable compounds include sodium monochlor-acetate, chloracetamide, glyceryl, trimono-chlor-acetate, dichlor-chlor-aceto-phenone, nitrophenyl chloromethyl ketone, and several others.

330,916. ACRYLACETIC ACIDS. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 19, 1929.

These acids and substitution products thereof are obtained by the action of mono or di-halogen acetic acids or their esters on aromatic hydrocarbons or their substitution products, other than amines with a reactive hydrogen atom in the amino group at 100°–275° C. in the absence of alkali. Examples are given of the production of α-naphthyl-acetic acid, ace-naphthyl-5-acetic acid, anthracyl-acetic acid, fluorenyl-acetic acid, brom- and chlor-naphthyl-acetic acids, the lactone of 2-oxy-l-naphthyl-acetic acid, and a di-naphthyl-acetic acid. The products are used in the manufacture of dyestuffs and pharmaceutical products.

330,918. HYDROGEN AND CARBON MONOXIDE MIXTURES G. Natta, 19, Via Rugabella, Milan, Italy. Application date, March 11, 1929.

A mixture of oxygen and water vapour in the proportion of not more than one volume of oxygen to two volumes of water vapour, is passed over carbon at a temperature below 750° C. and the carbon dioxide removed. The mixture contains two volumes of hydrogen to one volume of carbon monoxide, but if the oxygen and water vapour are preheated a mixture of 3 volumes of hydrogen to 1 volume of carbon monoxide is obtained. The mixture is suitable for the synthesis of hydrocarbons and methanol.

330,919. ALCOHOLS. G. Natta, Via Rugabella, Milan, Italy. Application March 11, 1929.

Carbon monoxide and hydrogen are passed over a catalyst consisting of the mineral Smithsonite after coarse disintegration or after calcining at 400°–450° C. A temperature of 400° C. and pressure of 260–300 atmospheres are employed and the product is mainly methyl alcohol.

330,921. PURIFYING FATTY ACIDS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 14, 1929.

The oxidation products of paraffin, carnauba or beeswax are treated with concentrated acetic acid while heating, and then cooled. The upper layer of unsaponifiable material containing esters, etc., is separated and the fatty acids recovered from the acetic acid solution by cooling or by removing the acetic acid by distillation.

330,922. SYNTHETIC RUBBER. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 16, 1929.

The process is for treating polymerisation products of butadiene and its homologues and analogues, which are insoluble in benzene and do not become plastic. These products are treated with an organic nitro compound such as a nitrobenzene or dinitro-naphthalene with heating, in the presence of a solvent or diluent, and thereby become soluble and plastic. In an example synthetic rubber obtained by shaking butadiene with sodium and magnesium oleates, as described in Specification No. 307,938 (see THE CHEMICAL AGE, Vol. XX, p. 507), is heated to 140°–152° C. with nitrobenzene, nitrobenzene and benzine, *m*-dinitrobenzene and benzene, or 1 : 3 : 5-trinitrobenzene and benzene. In the first two cases the rubber is recovered by expelling the liquid by steam, and in the other cases by precipitation with alcohol. Another example is given.

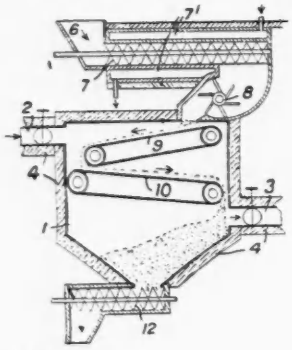
330,933. PURIFYING GASES. W. J. Huff, 3,424, University Place, L. Logan, Cambridge Arms Apartments, Charles Street, and O. W. Lusby, 824, Beaumont Avenue, Govans, all in Baltimore, U.S.A. Application date, January 19, 1929.

Hydrogen-containing gas is freed from sulphur by passing

it at a temperature above 250° C. over a metal or oxide of the fifth group, or a mixture of metals or oxides of metals of the fifth, sixth, and seventh groups with at least one metal of another group, *e.g.*, copper, silver, iron, nickel, cobalt, lead, tin, or antimony. A mixture of copper 80 per cent. and chromium, uranium, or vanadium 20 per cent. is suitable. The metals may be precipitated from the mixture of solutions of their salts, or a mixture of copper oxide with the other constituents may be melted in an oxidising flame and then poured into water to form shot-like material. Alternatively, solutions of the nitrates may be decomposed on a carrier such as pumice, firebrick, copper, copper oxide or ores. The material may then be treated with a non-combustible oxygen-free gas such as the blast gas of a carburetted water-gas process at 450° C., and may then be revivified at 451° C. with air or blast gas obtained in the manufacture of water gas.

330,934. Cracking Oils. H. S. Waite, 3, Central Buildings, Westminster. Application date, February 20, 1929.

Carbonaceous materials are distilled, and the vapours and gases passed through a heated layer of coke fed through the



330,934

chamber 1 by inclined screen conveyers 9, 10. The coke is fed through an inlet 6, conveyer 7, heated by a jacket 7^1, and star wheel 8, and is withdrawn by a conveyer 12. The gases are drawn off through a passage 3, and then contain an increased proportion of hydrocarbons.

330,941. Organic Acids. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 20, 1929.

2-Hydroxy-naphthalene-3-carboxylic acid or its zinc salt is heated with ammonium chloride and zinc oxide or carbonate in a current of dry air or ammonia to obtain 2 : 3-amino-naphthoic acid.

330,945-7. Ammonium Sulphate. W. G. Adam, The Old House, Loughton, Essex, D. G. Murdoch, 26, Olive Road, Cricklewood, and Gas Light and Coke Co., 84, Horseferry Road, London. Application date, March 20, 1929.

330,945. Ammonium sulphate is obtained in elongated crystals which do not cake, by the reaction of ammonia, carbon dioxide, and calcium sulphate, to which is added a small quantity of a salt of iron, chromium, aluminium, titanium, beryllium, zirconium, thorium, or yttrium, or a chromate or dichromate, and free acid.

330,947. Non-caking ammonium sulphate is obtained by passing ammonia into hot sulphuric acid containing a small quantity of a ferric salt, or a salt of chromium, aluminium, titanium, beryllium, zirconium, thorium, or yttrium, or a chromate or dichromate. The conditions are such that the solution is kept slightly acid.

330,981. Vulcanising Rubber. Rubber Service Laboratories Co., 335, South Main Street, Akron, Ohio, U.S.A. (Assignees of W. A. Moore, 49, Mull Avenue, Akron, Ohio, U.S.A.) International Convention date, November 12, 1928.

Rubber articles are vulcanised by heating to 200°-210° F. in water containing a suspension of an insoluble ultra accelerator, *e.g.*, 10 parts of the carbon disulphide derivatives of the reaction product of piperidine and formaldehyde, 1 part of oleic acid, and 0·2 parts of sodium hydroxide per thousand. Other accelerators specified include the carbon disulphide derivatives of aliphatic aldehydes with secondary aliphatic amines, alkyl derivatives of piperidine, pyrollidine, dialkylamines, dibenzylamine, and the protective colloid may be sodium or potassium salts of stearic or palmitic acids, gum arabic, saponin, starch, triethanolamine, and piperazine salts of higher fatty acids.

331,016. Thioamino Compounds. Imperial Chemical Industries, Ltd., Millbank, London, T. Birchall and S. Coffey, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, April 18, 1929.

Secondary amines are treated with sulphur chloride in aqueous neutral or alkaline solution or suspension. The amine salt may be used instead of the free amine, and the products have the formula $R\,R^1\,N.S_2.N\,R\,R^1$ where R and R^1 are univalent organic radicles, or together represent a divalent organic radicle. Examples are given of the treatment of an aqueous solution of diethylamine, a mixture of diethylamine hydrochloride and caustic soda, and an aqueous suspension of ethyl aniline.

331,056. Dyeing. W. W. Groves, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 23, 1929.

The azo dyestuffs described in specification 286,274 (see The Chemical Age, Vol. XVIII, p. 440) are obtained by impregnating the fibre with an arylide of 2 : 3-oxynaphthoic acid, treating with an acid solution of a diazotised 4-amino-diphenylamine, and then passing through a solution of a caustic alkali, ammonia, or sodium carbonate. An example is given.

331,100. Oxygenated Organic Compounds. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges. Frankfort-on-Main, Germany. Application date, June 28, 1929.

Aromatic hydrocarbons or their halogenated derivatives, in the liquid state, are treated at raised temperature and pressure with oxygen or a gas containing it in the presence of a substantial amount of water, and a small amount of an oxidation catalyst such as oxide or hydroxide of copper, nickel, cobalt, iron, oxide of manganese, cerium, osmium, uranium, vanadium, chromium, and zinc. Thus, toluene may be treated at 240° C. and 50-60 atmospheres pressure with oxygen in the presence of water and hydrated ferric oxide to obtain benzaldehyde and a little benzoic acid, benzyl alcohol, and dibenzyl ether. The products may be varied by using other catalysts, and by effecting the reaction in the presence of carbon dioxide. Other examples are given of the treatment of *p*-xylene to obtain *p*-toluic acid and *p*-toluic aldehyde, *m*-xylene to obtain *m*-toluic acid and *m*-toluic aldehyde, ethylbenzene to obtain phenyl-ethyl-carbinol and acetophenone, naphthalene to obtain benzoic and phthalic acids, anthracene to obtain anthraquinone, and *p*-chloro-toluene to obtain *p*-chloro-benzaldehyde and *p*-chlorobenzoic acid.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention :—303,900 (M. Polanyi and S. von Bogdandy), relating to chemical apparatus, see Vol. XX, p. 282 ; 308,684 (Bayerische Stickstoffwerke Akt.-Ges.), relating to phosphates and hydrogen, see Vol. XX, p. 524 ; 313,617 (A. Skita and F. Keil), relating to amino alcohols, see Vol. XXI, p. 178 ; 313,963 (J. L. Fohlen), relating to light hydrocarbons from carbonaceous materials, see Vol. XXI, p. 178 ; 315,666 (I.G. Farbenindustrie Akt.-Ges.), relating to esters and amides of 2 : 3-amino-naphthoic acid ; 318,595 (I.G. Farbenindustrie Akt.-Ges.), relating to vat dyestuffs, see Vol. XXI, p. 480 ; 318,633 (Kodak, Ltd.), relating to removal of water from aqueous formic acid, see Vol. XXI, p. 510.

Specifications Accepted with Date of Application

310,803. Ester salts of leuco compounds of vat dyestuffs. Development of. I.G. Farbenindustrie Akt.-Ges. April 30, 1928.

310,815. 2-chloro-benzo-thiazoles, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 30, 1928.

311,239. Flotation process for oxide ores. J. E. Barnitzke. May 7, 1928.

311,283. Dianthraquinonyl amines of the anthraquinone acridone series, Manufacture of. I. G. Farbenindustrie Akt.-Ges. May 8, 1928.

311,385. Dyestuffs containing metals, Manufacture of. Soc. of Chemical Industry in Basle. May 10, 1928.

311,707. Carrying out ester condensations. Dr. A. Wacker Ges. für Elektro Chemische Industrie Ges. May 14, 1928.

312,907. Thymol, Preparation of. Rheinische Kampfer Fabrik Ges. June 1, 1928. Addition to 293,753.

312,330. Dyestuffs, Manufacture of. J. R. Geigy Akt.-Ges. May 24, 1928.
313,153. Catalytic oxidation of ammonia. Selden Co. June 9, 1928.
314,542. Tri-substituted thioureas, Manufacture of. I.G. Farbenindustrie Akt.-Ges. June 30, 1928.
314,890. Condensation products of the anthraquinone-acridone series, Manufacture of. I.F. Farbenindustrie Akt.-Ges. July 3, 1929. Addition to 311,283.
317,734. Cast iron and steel containing copper, Manufacture of. F. Heusler. August 20, 1928.
318,550. Oxidation of benzene hydrocarbons, Process for. I.G. Farbenindustrie Akt.-Ges. September 5, 1928. W. W. Triggs. (*Norton Co.*)
332,903. Aluminium oxide, Production of. W. W. Triggs (*Norton Co.*). April 27, 1929.
332,910. Desulphurization of liquid hydrocarbons. Stadberger Hutte Akt.-Ges., and G. Feld. February 26, 1929.
332,911. Derivatives of quinoline, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 25, 1929.
332,917. Acetylene from hydrocarbons or mixtures containing the same, in the electric arc. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 24, 1929.
332,926. Stable and sterilised solutions of salts of para-dialkylamino-aryl-phosphinous acids. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) April 30, 1929.
332,932 and 332,940. Azo-dyestuffs insoluble in water, Manufacture of. O. Y. Imray. (*I.G. Farbenindustrie Akt.-Ges.*) March 21 and 28, 1929.
332,944. Refining mineral oils and like carbonaceous materials. Process for. H. D. Elkington. (*Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij.*) April 27, 1929.
332,945. Compound of urea and calcium nitrate, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 29, 1929.
332,948. Solid urea or fertilizers containing urea, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 29, 1929.
332,954. Azo dyes, Manufacture of. Imperial Chemical Industries, Ltd., and R. Brightman. April 29, 1929.
332,960. Sulphonated condensation products, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) May 1, 1929. Addition to 320,056.
332,963. Synthetic resins, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 30, 1929. Addition to 310,816.
332,964. Shaped articles from urea or thiourea, solid polymerised formaldehyde and fillers. Bakelite Ges. February 3, 1928.
332,983. Concentration of aqueous acetic or formic acid. Imperial Chemical Industries, Ltd., and F. D. Leicester. May 17, 1929.
332,998. Pyrolysis of unsaturated hydrocarbons. Imperial Chemical Industries, Ltd., T. S. Wheeler, and J. McAulay. June 4, 1929.
333,016. Basic dyestuffs, Manufacture of. Imperial Chemical Industries, Ltd., and M. Wyler. June 27, 1929.
333,023. Sodium salt of paraoxyphenylarsenic acid, Preparation of. Union Chimique Belge Soc. Anon. June 7, 1929.
333,079. Acrylic acid chloride, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) September 14, 1929.
333,090. Carbon disulphide, Production of. I.G. Farbenindustrie Akt.-Ges. November 17, 1928.
333,098. Ammonium chloride, Manufacture of. J. I. Bronn and Concordia Bergbau Akt.-Ges. October 4, 1929.
333,127. Separation of gaseous mixtures by liquefaction. Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés C. Claude. December 18, 1928. Addition to 263,732.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Alcock, H. E., Shine, G. T., and Thompson, C. H. Production of barium monoxide in tunnel ovens. 24,199. August 13.
Allam, P. S. Destructive hydrogenation of carbonaceous materials. 24,361. August 14.
Bentley, W. H., Blythe and Co., Ltd., W., and Catlow, B. Separation of paratoluidine from mixtures of orthotoluidine, etc. 24,093. August 12.
Bradley, W., and Loveluck, R. J. Production of anthraquinone derivatives. 24,420. August 14.
Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Protecting wool, etc., against textile pests. 24,023. August 11.
—— Manufacture of esters of the leuco compounds of vat dyestuffs. 24,024. August 11.
—— Manufacture of esters of the leuco compounds of vat dyestuffs. 24,128. August 12.
—— Manufacture of products readily soluble in water. 24,149. August 12.
—— Manufacture of azo dyestuffs containing copper. 24,150. August 12.
—— Manufacture of methylene iodide. 24,518. August 15.
—— Manufacture of unsaturated aliphatic compounds. 24,519. August 15.
—— Production of X-ray photographs. 24,520. August 15.
—— Treatment of textiles. 24,592. August 16.
Compagnie Lorraine de Charbons pour l'Electricité. Treatment of pigments. 24,423. August 14. (France, September 7, 1929.)
Geigy Akt.-Ges., J. R. Manufacture of disazo-dyestuffs. 24,045. August 11. (Germany, August 9, 1929.)
Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of arsenic acids. 24,041. August 11.
—— Hardening casein, etc. 24,043. August 11.
—— Manufacture of non-irritant a seno-benzene compounds. 24,132. August 12.
—— Manufacture of arsonic acids. 24,406. August 14.
—— Manufacture of leuco vat dyestuff preparations. 24,407. August 14.
—— Manufacture of vat dyestuff pastes. 24,408. August 14.
Groves, W. W., I.G. Farbenindustrie Akt.-Ges., and Soc. of Chemical Industry in Basle. Manufacture of disperse systems. 24,409. August 14.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Apparatus for drying, degasification, etc., of fuels. 23,907. August 11.
—— Degumming raw silk. 24,007. August 11.
—— Manufacture of carbon monoxide and hydrogen from methane. 24,008. August 11.
—— Continuous running furnaces. 24,116. August 12.
—— Manufacture of non-irritant arsenobenzene compounds. 24,132. August 12.
—— Manufacture of esters of the leuco compounds of vat dyestuffs. 24,148. August 12.
—— Manufacture of products readily soluble in water. 24,149. August 12.
—— Manufacture of azo dyestuffs containing copper. 24,150. August 12.
—— Separation of butadiene hydrocarbons. 24,247. August 13.
—— Manufacture of coloured artificial articles. 24,526. August 15.
I.G. Farbenindustrie Akt.-Ges. Device for continuous development of kinematograph films. 24,044. August 11. (Germany, January 22.)
—— Portable dark room. 24,272. August 13. (Germany, August 22, 1929.)
—— Manufacture of fine artificial fibres. 24,273. August 13. (Germany, August 14, 1929.)
—— Manufacture of arsenic compounds. 24,274. August 13. (Germany, August 24, 1929.)
—— Conferring permanent shape upon knitted, etc., fabrics of cellulose acetate silk. 24,395. August 14. (Germany, August 15, 1929.)
—— Manufacture of substances of high molecular weight. 24,410. August 14. (Germany, August 14, 1929.)
—— Manufacture of hydroxyacylamino-benzines. 24,504. August 15. (Germany, August 27, 1929.)
Imperial Chemical Industries, Ltd. Production of anthraquinone derivatives. 24,419, 24,420. August 14.
—— Manufacture of cyanogen halides. 24,495. August 15. (United States, August 16, 1929.)
Imperial Chemical Industries, Ltd., and Du Pont de Nemours and Co. Moulding-compositions containing cellulose derivatives. 24,235. August 13.
Kunstdünger Patent-Verwertungs Akt.-Ges. Method of producing diammonium phosphate. 24,141. August 12. (Sweden, August 23, 1929.)
Schoenberg, G. Preparing hydrogen peroxide-phosphate compounds. 24,014. August 11. (Austria, August 10, 1929.)
—— Introducing active oxygen into organic compounds. 24,015. August 11. (Austria, August 10, 1929.)
Shaw, C., and Thompson, R. F. Production of anthraquinone derivatives. 24,419. August 14.
Soc. of Chemical Industry in Basle. Manufacture of N. substituted derivatives of the pyridine series. 24,046. August 11. (Switzerland, August 10, 1929.)

Italian Production of Pyrite Ash

THE annual report of the Italian Montecatini company states that the Marghera plant during 1929 produced 120,223 tons of decopperised pyrite ash, as compared with 69,478 tons in 1928. There were produced 47,409 tons of pyrite ash briquettes for use in blast furnaces, as against 48,873 tons in 1928. In connection with the desulphurisation of the pyrite ash at the Marghera plant, 5,207 tons of Glauber's salt were obtained in 1929, as compared with 3,725 tons in 1928, and 2,884 tons of precipitated copper, as against 1,930 tons in 1928.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID, CHROMIC.—1s. 0½d. per lb. d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—Spot £20 to £25 per ton, makers' works according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.

CHROMIUM OXIDE.—9½d. and 10d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 10s. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8d. per lb. d/d U.K.

SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.

SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2 cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS.—3½d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3½d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6d. to 7½d. per lb. Crude 60's 1s. 11d. to 2s. per gall. August/December.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 4d. per gall. B.P., 5s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 7d. to 2s. 10d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 1s. 11d. to 2s. Dark, 1s. 6½d. to 1s. 7½d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5½d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 9d. to 1s. 11d. per gall. Pure, 1s. 11d. to 2s. 2d. per gall

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6¼d. to 6⅜d. per gall. Home, 4d. per gall. d/d. Middle oil, 4¼d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1¼d. to 1⅜d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8¼d. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 6d. per gall. Solvent 90/190, 11d.. to 1s. 2½d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £3 to £4 per ton. Whizzed, £4 to £5 per ton. Hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £10 per ton. Purified Crystals, £14 10s. per ton. Flaked, £11 per ton.

PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer s works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8¼d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8¼d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8¼d. per lb. d/d buyer's works.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.

o-CRESOL 30/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34·5° C.—1s. 9½d. per lb., in ton lots.

DICHLORANILINE.—1s. 10d. per lb. f.o.r. works.

DIMETHYLANILINE.—Spot, 1s. 8d. per lb., drums extra d/d buyer's works.

DINITROBENZENE.—8d. per lb.

DINITROCHLORBENZENE.—£74 per ton d/d.

DINITROTOLUENE.—48/50° C., 7½d. per lb.; 66/68° C., 9d. per lb f.o.r. works.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb, 5-cwt. lots, drums extra, d/d buyer's works.

NITRONAPHTHALENE.—9d. per lb.

R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.

SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 1d. per lb. ex works.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

WOOD CREOSOTE.—1s. 9d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 2d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—4s. 10½d. to 5s. 3d. per lb.

CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra

CARBON BLACK.—3½d. to 4 1/16d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 9d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
ZINC SULPHIDE.—8d. to 11d. per lb

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton, ex wharf London, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 6d. to 1s. 6½d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 1d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb.
BISMUTH CARBONATE.—6s. 6d. per lb.
BISMUTH CITRATE.—6s. 9d. per lb.
BISMUTH SALICYLATE.—6s. 7d. per lb.
BISMUTH SUBNITRATE.—5s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 4s. 4d. per lb.
BISMUTH OXIDE.—8s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. per lb.
BISMUTH SUBGALLATE.—6s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 5½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 8d. per lb. Prices for 1 cwt. lots.
CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 3s. to 3s. 2d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 5d. per lb. for 28 lb. lots. Green, 3s. 1d. per lb., list price. U.S.P., 2s. 4d. to 2s. 7d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¼d. to 8½d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 17s. per lb. net; Synthetic, 9s. 6d. to 11s. per lb.; Synthetic detached crystals, 9s. 6d. to 11s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb
METHYL SULPHONAL.—18s. 6d. to 20s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENAZONE.—5s. 6d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—89s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 3d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125 lb. kegs
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—43s. 6d. per lb.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.—1s. 11d. per lb., B.P.C. 1923, and U.S.P. IX—2s. 3d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—9s. 6d. to 10s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 8s. 3½d. to 9s. 2d. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—12s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—10s. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21/22° C.).—7s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—11s. per lb.
CITRONELLOL.—8s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. 3d. per lb.
GERANIOL (PALMAROSA).—17s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—11s. 6d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—46s. per lb.
SAFROL.—2s. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—13s. to 15s. per lb. Ex Guaiacol, 12s. 6d. to 13s. 9d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.
ANISE OIL.—4s. 9d. per lb.
BERGAMOT OIL.—10s. per lb
BOURBON GERANIUM OIL.—21s. per lb.
CAMPHOR.—Brown, 1s. 9d. per lb.
CANANGA.—Java, 9s. per lb.
CASSIA OIL, 80/85%.—4s. 9d. per lb.
CINNAMON OIL LEAF.—6s. 9d. per oz.
CITRONELLA OIL.—Java, 2s. 5d. per lb., pure, Ceylon, 2s. 5d. per lb., c.i.f. U.K. port.
LAVENDER OIL.—Mont Blanc, 38/40%, 10s. 6d. per lb.
PEPPERMINT OIL.—English, 55s. per lb.; Wayne Cty., 12s. 9d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, August 21, 1930.

PRICES during the current week have been steady with one or two exceptions. The amount of business has been fair. The improved inquiry in export business continues.

General Chemicals

ACETONE.—Firm at £71 10s. to £80 per ton, according to quantity, and in steady demand.

ACID ACETIC.—Firm at £36 5s. to £38 5s. per ton for Technical 80% and £37 5s. to £39 5s. for pure 80%, according to quantity, delivered buyers works, and in good demand.

ACID CITRIC.—Still very quiet at 1s. 6½d. per lb., less 5%.

ACID LACTIC.—Firm at about £41 to £42 per ton for 50% by weight, and in steady demand.

ACID OXALIC.—In good request with prices firm at £30 7s. 6d. to £32 per ton, according to quantity.

ALUMINA SULPHATE.—Unchanged at £8 to £8 15s. per ton for 17/18% iron free quality.

ARSENIC.—Still quiet at about £15 15s. per ton, free on rails at mines.

CREAM OF TARTAR.—On the slow side at 88s. to 90s. per cwt., ex wharf London.

COPPER SULPHATE.—£21 to £22 per ton, free on rails.

FORMALDEHYDE.—In steady demand at £32 per ton, ex wharf London.

LEAD ACETATE.—Steady at £40 per ton for white and £30 per ton for brown, and in good request.

LEAD NITRATE.—£29 10s. to £30 per ton with a little better demand.

LITHOPONE.—Firm at £19 15s. to £23 per ton according to grade and in steady request.

CARBONATE OF POTASH.—96/98% arsenic free quality £28 10s. to £29 per ton.

PERMANGANATE OF POTASH.—Firm and in good request at 5½d. per lb., for B.P. Needle Crystals.

BICHROMATE OF SODA.—Firm at 3⅜d. per lb., with usual discounts for contracts.

SODIUM HYPOSULPHITE.—Photographic crystals £14 15s. per ton, Commercial £8 10s. per ton.

SULPHIDE OF SODIUM.—Unchanged at £10 5s. to £11 5s. per ton for solid and £11 5s. to £12 5s. for the Broken, according to quantity, carriage paid.

TARTAR EMETIC.—11d. per lb.

ZINC SULPHATE.—£12 10s. per ton.

Coal Tar Products

The Coal Tar Products market remains quiet, and there are few inquiries.

MOTOR BENZOL.—Still quoted at about 1s. 5½d. to 1s. 6½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Remains at about 1s. 2½d. to 1s. 3d. per gallon.

HEAVY NAPHTHA.—Unchanged at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL.—Unaltered at 3d. to 3½d. per gallon f.o.r. in the North, the London price being 4d. to 4½d. per gallon.

CRESYLIC ACID.—Remains at 2s. per gallon for the 98/100% quality, whilst the Dark quality 95/97% is offered at 1s. 10d. per gallon.

NAPHTHALENES.—Firelighter grade is offered at £3 10s. to £3 15s. per ton, the 74/76 quality being £4 to £4 5s. per ton, and the 76/78 quality about £5 per ton.

PITCH.—Unchanged at a nominal price of 37s. 6d. to 42s. 6d. per ton f.o.b. East Coast port.

THE following additional prices have been received :—

CARBOLIC ACID.—There is little change in the position to report, small quantities being offered at 7½d. per lb., 5-ton contracts at 7d. per lb. and larger quantities at 6½d. to 6¾d. per lb.

CRESYLIC ACID.—Pale 98/100% is 1s. 10d. to 2s., with better grades at anything up to 2s. 6d. to 2s. 7d., according to quantity and specification.

ASPIRIN.—No change.

PYRIDINE.—An easy market at 3s 4d. to 3s. 6d. per gallon for 90/160.

MOTOR BENZOL.—1s. 6d. to 1s. 6½d. per gallon.

PHENACETIN.—Unchanged at 3s. 9d. to 4s. 1d., though it seems possible to purchase below these prices.

METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.

VANILLIN from Clove Oil is quoted at 13s. 6d. to 14s. 6d., with Guiacol offered at 12s. 6d. upwards (per lb.).

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—During the week there has been evidence of renewed firmness and little business has been done below £7 per ton f.o.b. U.K. port in single bags, for prompt shipment. Prices are higher for forward positions. The market is, however, still uncertain and transactions have been small.—*Home.*—Buyers are still awaiting the announcement of home prices, and it is expected that these will be announced before the end of the month.

Nitrate of Soda.—Most merchants consider that the prices of this product are too high, and are hopeful that the price of ammonium sulphate and nitro-chalk will be lower.

Scottish Coal Tar Products

DISTILLERS are maintaining their quotations for most products despite the scarcity of business and large stocks available, but refined tar is now being offered at a reduced price for reasonable quantities.

Cresylic Acid.—Market remains quiet. Pale 99/100%, 1s. 9½d. to 1s. 10½d. per gallon; pale 97/99%, 1s. 8½d. to 1s. 9½d. per gallon; dark 97/99%, 1s. 7½d. to 1s. 8½d. per gallon; high boiling, 1s. 9d. to 1s. 11d. per gallon; all at makers' works.

Carbolic Sixties.—Makers are holding up their supplies until prices are steadier. Value is nominal at 2s. to 2s. 2d. per gallon.

Creosote Oil.—Only virgin oils are finding a ready market, other grades being without interest. Specification oil, 3d. to 3½d. per gallon; gasworks ordinary, 3¼d. to 3½d. per gallon; washed oil, 3¼d. to 3⅝d. per gallon; all in bulk quantities ex makers' works.

Coal Tar Pitch.—Continental inquiries are scarce and value is easy at about 45s. to 47s. 6d. per ton, f.a.s. Glasgow for export, and about 4s. 6d. per ton, ex works for home trade.

Blast Furnace Pitch.—Remains very slow with controlled prices unaltered at 30s. per ton, f.o.r. works for home trade and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Stocks being high, makers have reduced quotations to 3d. to 3½d. per gallon, ex works in buyers' packages.

Blast Furnace Tar.—Controlled price remains at 2¾d. per gallon.

Crude Naphtha.—Production is low and value remains at 4d. to 4¼d. per gallon in bulk, f.o.r.

Water White Products.—Orders are scarce and some makers are inviting bids. Motor benzole, 1s. 5½d. to 1s. 6d. per gallon; solvent naphtha, 90/160, 1s. 2½d. to 1s. 3½d. per gallon; heavy naphtha, 90/190, 1s. to 1s. 1d. per gallon; all ex works naked.

Latest Oil Prices

LONDON, August 20.—LINSEED OIL was steady. Spot, ex mill, £34; August, £32 2s. 6d.; September-December, £31 7s. 6d.; and January-April, £29 7s. 6d., naked. COTTON OIL was dull. Egyptian crude, £27 10s.; refined common edible, £33; deodorised, £34 10s., naked, ex mill. RAPE OIL was inactive. Crude extracted, £34; technical refined, £35 10s. TURPENTINE was quiet and 6d. to 3s. per cwt. lower. American, spot, 34s. 6d.; September-December, 35s. 3d.; Russian, spot, 32s. 6d.

HULL.—LINSEED OIL.—Spot, £33; August, £32 15s.; September, £32 5s.; September-December, £32; January-April, £30 2s. 6d. per ton, naked. COTTON OIL.—Egyptian crude, spot, £29 15s.; edible refined, spot, £30; technical, spot, £30; deodorised, spot, £32 per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent., spot, £28 per ton, naked. GROUNDNUT OIL.—Crushed extracted, spot, £31; deodorised, spot, £35 per ton. SOYA OIL.—Extracted and crushed, spot, £27 10s.; deodorised, spot, £31 per ton. RAPE OIL.—Crushed extracted, spot, £34 10s.; refined, spot, £36 10s. per ton. TURPENTINE, CASTOR OIL and COD OIL unaltered.

South Wales By-Products

THERE is very little change in South Wales by-product activities. The demand for most products is slow and unsatisfactory. Pitch remains lifeless, stocks being far in excess of demand. Prices are nominal around the 47s. per ton f.o.b. mark. Road tar is quiet, with quotations steady at about 13s. per 40-gallon barrel. Refined tars are unchanged, gasworks and coke-oven tar having a fair call with values unchanged. Solvent naphtha has a steady, but moderate, call at from 1s. 1½d. to 1s. 3½d. per gallon, but heavy naphtha is slow at from 10d. to 1s. per gallon. Motor benzol continues to have a good call, values being unchanged at from 1s. 1½d. to 1s. 3½d. per gallon. Creosote is slow and weak at from 2¾d. to 3¾d. per gallon. Sulphate of ammonia has practically no call.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.

Glasgow, August 20, 1930.

THE market continues to be dull, industrial depression having a marked effect.

Industrial Chemicals

ACETONE B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—Prices ruling are as follows:—Glacial 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical 80%, £36 5s. per ton, delivered.

ACID BORIC.—Granulated, £22 per ton; crystals, £23; B.P. crystals, £31 per ton; powder, £32 per ton, in 1 cwt. bags delivered free, Great Britain, in 1 ton lots and upwards.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACIDNITRIC 80° quality.—£23 per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—On offer at the same price, viz., 3½d. per lb., ex store. Offered from the Continent at 3⅛d. per lb., ex wharf.

ACID SULPHURIC.—£3 2s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC B.P. CRYSTALS.—Quoted 1s. 1d. per lb., less 5% ex wharf. On offer for prompt delivery from the Continent at 1s. 2½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—Quoted at round about £8 15s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10¼d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID 880°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material now obtainable at round about £30 per ton, ex wharf. On offer for shipment from China at about £27 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports. For Continental material our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 15s. per ton, c.i.f. U.K. ports.

COPPERAS GREEN.—At about £3 15s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE 40%.—Now quoted £33 per ton, ex store. Continental material on offer at about £32 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £33 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £46 per ton, c.i.f. U.K. ports.

LEAD, ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality, 64 O.P., quoted 1s. 8d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4⅛d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store, offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £26 5s. per ton, ex wharf. Crystals, 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb., ex wharf.

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton, in drums, £18 15s. per ton in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyers' station. Minimum 4-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅞d. per lb. delivered buyers' premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 13s. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 2s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 55s. per ton, ex works, 57s. 6d. per ton delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 broken 60/62%, £11 per ton. Crystals 30/32%, £8 2s. 6d. per ton, all delivered buyers' works on contract minimum 4-ton lots. Special prices for some consumers. Spot material, 5s. per ton extra. Crystals, 2s. 6d. per ton extra.

SULPHUR.—Flowers, £12 per ton; Roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £20 per ton f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £12 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Russian Potash Deposits

HERR KLAUS and Professor Spackeler, two of the German nitrate experts who, on the request of the Soviet Nitrate Syndicate, recently examined the potash deposits in the Ural mountains, announced last week that production was being taken up at a place where there were potash deposits extending over an area of 45 miles, but that this was only a small part of the enormous potash deposits in the Urals. Two pits were now in working condition, and three more were to be built shortly, and it was expected that their production would be sufficient to meet the requirements of Russian agriculture.

Herr Klaus declared that in regard to exports the Russian had promised to co-operate with the German Nitrate Syndicate, but that the Russian exports would not affect the world position of the German and Alsatian nitrate industry. The necessary machinery for the Ural pits had been supplied by a Dortmund firm.

Illingworth Carbonisation Co.

THE board of the Illingworth Carbonisation Co., in their latest progress report, state that the carbonisation plant erected at Snowdown for Pearson and Dorman Long has been in operation since the end of May, giving a steady daily output of excellent hard smokeless fuel, together with the by-products. The plant at Allerton erected for the T. and R. W. Bower (Illingworth) Carbonisation Co. is also producing a clean smokeless fuel, with a full range of by-products. It is stated that a large number of inquiries has been received which are the subject of important negotiations. The directors are satisfied from the results that the original claims are fully substantiated, and they state that the actual throughputs exceed the estimated production.

Manchester Chemical Market

[From our Own Correspondent.]

Manchester, August 21, 1930.

In common with one or two other branches of trade on this centre during the past week, the chemical market has been notable for a somewhat brighter atmosphere, although up to the present it has all been very largely a matter of sentiment, the hope being that the next few weeks will witness some improvement in business when the holidays come to an end. If anything, inquiries this week have been on a slightly better scale, but actual demand in most sections has been confined to prompt or near delivery parcels. The chlorates of potash and soda, which have been reduced, represent the outstanding changes in the price position.

Heavy Chemicals

A moderate inquiry is being experienced in the case of prussiate of soda and quotations are held at from 4¾d. to 5¼d. per lb., according to quantity. The demand for chlorate of soda continues rather quiet, and the latest price cut in this section brings current offers of the material to round £24 15s. per ton. There is a quietly steady call for both alkali and bicarbonate of soda, offers of which are firm on the basis of £6 and £10 10s. per ton respectively. Bichromate of soda meets with a fair demand at 3⅜d. per lb., less 1 to 3½ per cent., according to quantity. Phosphate of soda is fairly steady at from £11 to £11 10s. per ton for the dibasic material. A moderate amount of interest is being shown in the case of caustic soda and prices are firm on a contract basis of from £12 15s. to £14 per ton, according to grade. Hyposulphite of soda is steady although only a quiet demand is reported; the commercial quality is quoted at round £9 per ton, and the photographic at £15 5s. The movement of saltcake is on moderate lines, with current offers at from about £2 15s. per ton. Inquiry in the case of sulphide of sodium is on a restricted scale and easier prices are being indicated, the 60-65 per cent. concentrated solid quality being quoted at about £9 per ton and the commercial grade at £7 15s.

Very moderate sales are reported of carbonate of potash offers of which are at £24 10s. to £25 per ton. The demand for chlorate of potash is quiet with prices now down to about £25 10s. per ton. There is a fair inquiry about for yellow prussiate of potash and prices in this section are well held at from 6¾d. to 7¼d. per lb., according to quantity. Bichromate of potash is in quietly steady request on the basis of 4⅛d. per lb. The demand for permanganate of potash continues rather slow, but values keep up at round 5½d. per lb. for the B.P. quality and 5¼d. for the commercial. Caustic potash is quoted at round £29 10s. per ton, with the buying movement on quiet lines.

Arsenic is maintained at about £16 per ton at the mines for white powdered, Cornish makes, a moderate amount of business being put through. Weakness continues in evidence in the case of sulphate of copper, values this week being at from £22 to £22 10s. per ton, f.o.b. There has been no change in the price position of the lead products but the demand is quiet; the white and brown acetates are at £36 and £35 per ton, and nitrate at about £29 10s. The acetates of lime seem to be fairly steady at the moment, and a moderate business is passing at round £7 10s. per ton for the brown material and £14 10s. for the grey.

Acids and Tar Products

The demand for tartaric acid is quiet, and the price tendency remains easy at 1s. 0½d. per lb. Citric acid keeps up at about 1s. 6½d. per lb., although sales of this material are by no means active. Oxalic acid is in quiet request with prices maintained at £1 12s. per cwt., ex store. There is a moderate inquiry about for acetic acid, values of which are at round £37 per ton for the 80 per cent. commercial, in ton lots, and from £47 to £51 per ton for the glacial quality, according to quantity.

Pitch is nominally unchanged at about 47s. 6d. per ton, f.o.b., with some inquiry in circulation export account. Trade in creosote oil is of moderate extent and prices are steady at from about 3d. to 4½d. per gallon, naked, according to grade. Carbolic acid is quiet and not too strong at 2s. 2d. per gallon, naked, for 60's crude, and about 7d. per lb. for crystals. There is a moderate movement of solvent naphtha at about 1s. 2d. per gallon.

Company News

Pinchin, Johnson and Co., Ltd.—The directors ave announced an interim dividend of 10 per cent. actual, less tax, in respect of the year ending December 31, 1930, payable on September 1. This is at the same rate as in the previous year, but owing to a capital bonus of one new share for every ten shares held, distributed earlier in the year, is payable on a larger capital.

Bradford Dyers' Association, Ltd.—At a meeting of directors, in Bradford, on Monday, it was decided to declare an interim dividend on the ordinary shares on account of 1930 at the rate of 5d. per share (2$\frac{1}{12}$ per cent.), subject to income tax. Warrants will be posted on September 1. It is stated that the accounts show that no profit was made in the half-year to June 30, and that the above dividend has been declared out of the amount carried forward last year. The half-yearly preference dividend was paid on July 1 last.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal" have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Australia.—A Melbourne firm manufacturing plaster sheets, mouldings, etc., desires to represent for the whole of the Commonwealth makers of printing inks, dyes, pigments, and chemicals for the paint trade. (Ref. No. 156.)

Canada.—The Senior Trade Commissioner at Montreal reports that a local telephone company desires to get into touch with United Kingdom manufacturers of stoneware conduits. (Ref. B.X. 6,704.)

Egypt.—The Stores Department of the Egyptian Ministry of Education is calling for tenders, to be presented in Cairo by September 20, for the supply of paint, varnish, dry colour, wood stain, soft soap, sandpaper, chemicals and miscellaneous painting and decorating materials. (Ref. No. B.X. 6,715.)

South Africa.—The South African Railways and Harbours Administration is calling for tenders, to be presented in Johannesburg by September 29, for the supply of approximately 26,900 imperial gallons of disinfectant fluid. Tender No. 1738. (Ref. No. B.X. 6,717.)

Tariff Changes

Australia.—Crude silicon carbide in rough crushed lump form and crude aluminium oxide in rough crushed lump form have been added to the list of materials regarded as raw materials for the purpose of applying the British Preferential Tariff.

British Guiana.—The Customs Duties Ordinance provides for the duty-free importation of sulphur, tin crystals, muriatic acid, alum, phosphoric acid and stannine, which the Comptroller of Customs is satisfied are to be used solely in the manufacture of white and yellow sugars.

"White Lead Paint" Prosecution

There was a sequel to two prosecutions against a firm of retailers for selling paint wrongly described, and for applying a false trade description, at the Lambeth Police Court on Wednesday, before Mr. Harold McKenna, when the paint manufacturers were summoned under the Merchandise Marks Act, 1887. The summons was taken out by Mr. Hedley Miller, the secretary of the White Lead Paint Section of the London Chamber of Commerce, of 1, Oxford Court, Cannon Street, London, against E. B. Blackwell, Ltd., of 21-23, Bedford Road, Clapham, S.W., paint, varnish and enamel manufacturers, and they were summoned for selling certain goods, to wit, a mixture of barium sulphate and other substances, to which a false trade description was applied, namely "Superfine White Paint, containing Genuine English Stack White Lead." There was a second summons for applying a false trade description to the articles. Mr. C. W. Measor appeared as prosecuting counsel, and Mr. Lasky with Mr. Raphael as counsel for the defendants.—The defendants pleaded not guilty and after a lengthy hearing, the case was adjourned until Tuesday next.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgment

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

PEET AND CO., LTD., Sydenham Dyeworks, Otley Road, Bradford, dyers. (C.C., 23/8/30.) £19 15s. 2d. July 16.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debt due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

BRYTEENA DYEING CO., LTD., London, W. (M., 23/8/30.) Registered July 30, £5,000 debentures; general charge.

CELLON, LTD. (late CELLON (RICHMOND), LTD.), London, W., varnish manufacturers. (M., 23/8/30.) Registered August 5, £10,000 debentures; charged on properties at Richmond, etc., also general charge. *£40,000. January 14, 1930.

SOUTHERN SILICA, LTD., Melksham. (M., 23/8/30.) Registered August 6, £1,500 debentures, part of amount already registered; general charge. *£6,900. December 31, 1929.

VELTENE, LTD., London, E.C., soap manufacturers. (M., 23/8/30.) Registered August 5, £1,500 debenture, to L. Weis, The Hern, Beddington Lane (Surrey); general charge.

Receivership

CAVENDISH'S, LTD. (R., 23/8/30.) Sir Harold J. de C. Moore, Kt., of 4, London Wall Avenue, E.C., was appointed Receiver on December 16, 1929, under powers contained in charge dated December 21, 1928. (Notice filed August 8, 1930).

London Gazette, &c.

Company Winding Up Voluntarily

LEONARDS MANUFACTURING CHEMISTS, LTD. (C.W.U.V., 23/8/30.) By reason of its liabilities, August 12 J. James, 4, Walbrook, London, E.C., appointed as liquidator.

Notices of Intended Dividends

DOBSON, William Berry Collier, "Collyhurst," Churchway, Weston Favell, Northampton, polish manufacturer. Last day for receiving proofs, September 2. Trustee, T. Bengough, 6, The Parade, Northampton, Official Receiver.

BARBER, John Edgar, oil, soap and disinfectant manufacturer, Primrose Hill Works, Pendleton, Lancashire, trading as BARBERS. Last day for receiving proofs, September 6. Trustee, A. T. Eaves, 47, Mosley Street, Manchester.

New Companies Registered

JOSEPH P. EMERY, LTD., Grange Street Colour Works, Grange Street, Cobridge, Stoke-on-Trent. Registered August 16. Nominal capital, £7,000 in £1 shares. To adopt an agreement with E. E. Emery and P. A. Emery, and to carry on the business of colour manufacturers formerly carried on by them at Grange Street, Cobridge, Stoke-on-Trent, and that of manufacturers of potters' colours, chemicals, materials and machinery, earthenware, china, glass, majolica, and stoneware, etc. Directors: E. E. Emery, Springfield House, London Road, Newcastle, Staffs; J. W. Emery, and P. A. Emery.

UNEX SINGLE SHEET SAFETY GLASS CO., LTD., 36/38, Victoria Street, London, S.W.1. Registered August 15. Nominal capital, £100 in 1s. shares. To acquire the registered trade mark "Unex" and to carry on the business of manufacturers of and dealers in safety glass and acetate or other chemical products, etc. A subscriber: E. E. Basset, 12, Winns Avenue, London, E.17.

Ethyl Mercaptan

An Efficient Warning Agent for Gas Leaks

ETHYL mercaptan, an organic sulphur compound, has been found to be a practical warning agent for the detection of leaks in natural gas distribution systems, as the result of investigations conducted by the United States Bureau of Mines, Department of Commerce. It is necessary that warning agents of this kind should be distinctly malodorous, and ethyl mercaptan fully complies with this condition, as its odour is described as that of a mixture of garlic, onions, decayed cabbage, sewer gas, and hydrogen sulphide.

The detection of leakage is a recognised problem in the safe and economic distribution and use of natural gas. Natural gas is practically odourless and therefore lacks the property of indicating significant leakage by the sense of smell, the means most widely used by gas employees and consumers for detecting leaks of the more odorous types of fuel gases. In view of the recognised value of the odour of gas for indicating leakage at the time of occurrence the Bureau of Mines has studied the possibility of adding small amounts of highly odorous substances to types of fuel gas (such as blue water gas and natural gas) that lack warning properties. These studies revealed that the mercaptans were promising substances to accomplish this purpose, not only for odorising fuel gases but for other purposes where it was desired to give warning through the sense of smell.

In general, the mercaptans closely resemble the alcohols and are often termed thio-alcohols. They differ from the alcohols, however, in that the hydrogen may be replaced by heavy metals to form mercaptides. This reaction apparently takes place very slowly in natural-gas pipe lines when the low concentration of ethyl mercaptan vapour necessary for warning-agent purposes is used.

Very Intense Odour

Ethyl mercaptan has a very intense, disagreeable odour, detectable in dilutions as high as 1 part ethyl mercaptan in 1 billion parts of air, and will give warning to conscious persons in concentrations of 1 part ethyl mercaptan to 15 million parts of air or 0·01 pound per million cubic feet of air. It is by virtue of this disagreeable odour that it quickly elicits attention and response when used as a warning agent.

The odorising of natural gas with ethyl mercaptan was found to be a practical means for detecting leakage and a much cheaper means than usual inspection methods. Concentrations of 7·7 to 9·3 lb. of ethyl mercaptan per million cubic feet of gas were found very effective in indicating house leaks. It is thought that half that amount or even less would be ample to indicate leaks of significant magnitude. Concentrations of 31·0 to 46·5 lb. of ethyl mercaptan per million cubic feet of gas were found effective in indicating underground leaks in mains and service lines. The use of ethyl mercaptan caused no complaints from customers unless leaks were present.

Since completing the studies mentioned, the Bureau of Mines jointly with the American Gas Association has conducted further investigations dealing with the use of warning agents for fuel gases. The results of this work will be published later. Further details are given in Report of Investigations 3007, "Use of Ethyl Mercaptan to Detect Leaks in Natural-Gas Distribution Systems," by R. R. Sayers, A. C. Fieldner, W. P. Yant, R. D. Leitch, and S. J. Pearce, copies of which may be obtained from the United States Bureau of Mines, Department of Commerce, Washington, D.C.

Compound Fertiliser Production in Czechoslovakia

THE Marienberg plant of the Czechoslavak Nitrogen Works Co., in which the Aussiger Verein has a 25 per cent. interest, is about to start production on a combination of ammonium nitrate and calcium carbonate in an effort to supply Czechoslovakia with nitrate nitrogen to supplement domestic cyanamide and ammonium sulphate. Marienberg will doubtless develop other nitrates later.